

# The Iron Age

A Review of the Hardware and Metal Trades.

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## Carr's Hoisting Engine.

The hoisting engine of which we present an illustration is built by Mr. A. Carr, of 43 Cortlandt street, New York. It is intended to meet the want for a cheap and economical hoisting engine. A simple inspection of the engraving will at once settle its position as a mechanical design; compactness and strength, without the least crowding of parts being at once evident. All the parts subjected to heavy strains, whether in one direction or alternating, such as the centers of pinion and large wheel, and of the large wheel and the brake, and of the steam cylinder and crank axle, are connected by straight solid framework. That is, the strains are all "met by straight lines;" hence the remarkable rigidity and steadiness of the machine when running at the highest speed. The method of transmitting the power of the engine to the "drum" or "spool" on which the rope is coiled is by internal friction gearing, this being one of the most decided peculiarities of the engine.

The advantages of this kind of gearing for a hoisting engine are numerous: it is perfectly smooth and noiseless in its action, while it can be thrown in and out of gear easily without the slightest jar to the machine. Thus, either lifting the load or allowing it to descend the engine runs always in one direction without stopping, while accidents in hoisting are much less likely to occur than with ordinary gearing. For example, should a load catch on the side of a hatch or other fixed object as it is being lifted, or should it be carelessly hauled up against the block (all of which occurs frequently in hoisting, this gearing will slip, just as a belt will when a sudden strain is thrown on it, while with ordinary gearing the rope or chain would probably be parted and the load precipitated).

Beside these general advantages, however, this particular form (internal friction gearing) has other points of superiority, viz.: The contact of the surfaces, with the same pressure, is greater than with external gearing, since the curves of the wheels are in the same direction, hence these wheels "bite" better. They run much smoother also because the surface immediately on each side of the point of contact make a smaller angle with each other than in external, as there is less of the shearing action before and after the point of contact than with outside gearing. It may be remarked here that, theoretically, two circles can only touch at a point whether the smaller touches the larger internally or externally; and that the friction or "bite" of two surfaces varies as the pressure and is independent of the amount of surface in contact; but when the circles are solid circles of elastic material, and when the pressure is great for a very small contact, as in friction gearing, we find that the circles touch for an appreciable distance, and that the friction is greater than that due by the ordinary "law" calculated from experiments with broad surfaces and moderate pressure. The advantage gained by internal gearing, even in protection from dirt or occasional pieces of solid matter falling into the gearing, is considerable, as the large wheel really forms a cover for the whole movement.

Another marked feature of this engine is the ease and certainty with which it can be operated. It will, we think, be admitted that any machine of this kind (or for that matter any machine at all) so long as we cannot make it intelligent, must require some management, however little. Now suppose a hoisting engine were offered in which the different operations of hoisting, admitting steam, cutting off steam and holding the load suspended by the brake, lowering it to position, or lowering the empty hook or bucket, could be all effected with ease and certainty by simply moving one handle in different positions, and that that handle was limited in its movements by a stop, so that pulling it carelessly or forcibly would do no harm, we think most people would think this as near automatic as a hoisting engine could be made, yet this is just what Mr. Carr has done and will give the fullest guaranty of. To make this matter plain, let us suppose we are ready to start one of these engines: letting on steam from the boiler, we find that none of it reaches the engine even after opening the stop valve (near the engine). In the steam chest will be found a small regulating valve which is opened just enough to move the engine slowly over the center, the quantity of steam necessary to do this being very small. When the load is ready pull the upright handle toward the steam cylinder as far as it will come; this opens the steam full, and brings the gearing in contact, raising the load at full speed. When high enough, move the handle quickly in the opposite direction; this releases the gearing and cuts off the steam (excepting the small quantity passing the regulating valve which just keeps the engine in motion) and brings the outside of the large wheel against a fixed brake suspending the load. When ready to deposit the load in position relax the pressure on the handle and allow the

load to descend by the sliding of the outside of the large wheel over the brake; to lower the empty hook bring the handle to near the middle of its movement; this leaves the "drum" or "spool" and large wheel totally free from either the brake or the gearing when it will descend with its own weight. The operator does not even require to understand these operations, but simply needs to know enough to pull the handle when hoisting and push it off when lowering, all the operations described following necessarily from these movements. It is not even necessary to see the engine when using it.

On board ship a rope is often fastened through one of the holes in the handle, one end being taken direct to where the operator stands, the other is taken round a pulley, thus pulling one end will hoist while the other will draw the handle in the opposite direction for lowering; this is quite a common method of working this engine. The engraving represents a No. 1 engine with 5 inch cylinder and 6 inch stroke. They are also built double, that is, with a hoisting drum on each side of the engine, which may be used simultaneously or sep-

than the desired white. The wire is then drawn once to the finishing size.

Wire manufactured for the market is put up in 63 lb. bundles and 12 lb. stones. From sizes 0 to 30 it is sold in bundles, and from 16 to 36 in stones. Wire is very rarely drawn finer than No. 36, but for special purposes it has been made as fine as No. 40, viz., .0031 of one inch in diameter.

### OF GAUGES.

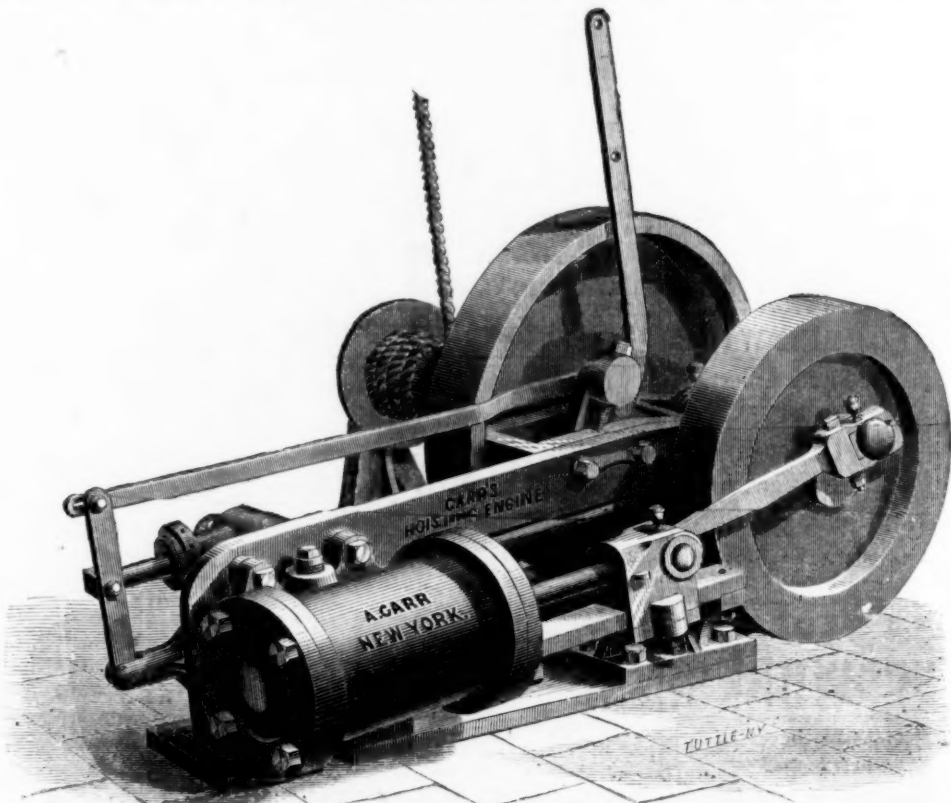
When the manufacture of wire had become an important item in Great Britain and Germany, the necessity of adopting some recognized standard was felt. Each manufacturer, or community of manufacturers, possessed certain methods of gauging; but none of these was generally accepted as a standard. Those of Birmingham adhered to their own gauge, and after a time the "Birmingham" became the recognized standard in commerce. This was not determined from any law of the reduction of area, because no such law had ever been enunciated, but was simply arranged to suit the metal; that is, a piece of wire which we will call No. 1 was reduced as great an amount as was possible, in one drawing, without per-

Now, in wire drawing and rod rolling we find, at the outset, the desired simplicity; unless, perhaps, we enter into exact mathematical discussions relative to the nature of rolling and drawing, analyzing and investigating the nature of the forces entering into these, and deducing excessively accurate laws. General laws only are desirable in practice. The "law of the resistance" has been determined, and a little careful study, and some few experiments will serve to determine the other problems, i. e., the proper amount of "taper" for the holes of the draw plates, and the effect, chemically and physically, of the coating of the wire. Experiment is to determine these, as well as other problems presenting themselves almost daily in the professional life of the engineer. The age, it has been said, is an age of progression, and experiment insures more rapid progression.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N. J.

## The Difficulties of British Iron Masters.

The Engineer, in an article on this subject,



CARR'S HOISTING ENGINE.

arately, one man managing them both with ease, as he can hold the two handles, one in each hand.

## Wire-Rod Rolling and Wire-Drawing.

G. BARRY WALL, M. E.

### OF THE PROCESSES OF DRAWING AND FINISHING WIRE.

Wire rods coming from the "cleaning house" are at first drawn down on "ripping blocks," which are generally 26 inches in diameter, making 24 revolutions per minute. In ripping, i. e., drawing without regard to accurate gauging—we may draw two sizes at once, for example, from No. 4 to 6. After annealing at No. 6 and cleaning we pass to the finishing blocks. Finishing is simply drawing accurately to gauge. From No. 6 to 9 the metal must pass through the plate twice, reducing a size and a half at each drawing. No. 9 must be annealed; and, if it is to be drawn further, the processes of cleaning and coating taking place at the same time. Lead-coated wire requires no grease in drawing, while that having the lime coat does. From No. 9 to 11 the wire must be drawn twice. At No. 11 the metal must be again annealed, and again at Nos. 14 and 18. Nos. 6, 9, 11, 14 and 18 being therefore the "annealing sizes." From 11 to 14 we draw twice, and in reducing from 14 to 18, three times. After drawing to No. 18 the wire is not annealed, being reduced but one size at a time, and is either drawn wet or dry. The term "wet drawing" means that the wire is drawn directly from a tub of Lees, i. e., rye flour and water, the object being to keep the metal clean, and to enable the wire to pass more readily through the die plates. Dry drawing produces "bright wire." Coppered wire is obtained by dipping in a solution of cupric sulphate, and drawing once to finishing size. Tinned wire is obtained by passing slowly through a "tinning bath" (a long trough containing molten tin), the temperature of which should not be much above the fusing point of that metal, 442° Fahr., as oxidation commences soon after reaching that point; and the tinned wire will have a yellowish color, rather

manently injuring its texture. The size of this reduced piece would be called No. 2, and so on.

In 1846, Mr. Holtzapffel made a proposition for the establishment of "an easy and exact system of gauges for sheet metals, wires and general purposes, founded upon the decimal sub-division of the standard inch. \*\*\* In which system the nomenclature should be so completely associated with the actual measures as to convey to the mind, even in the absence of the gauges themselves, a very close idea of the several spaces of the gauges or of the thicknesses or sizes of works measured thereby." He was not successful in the establishment of his standard. The workers in wire held to their old traditional gauges, and, notwithstanding numerous attempts have been made to prepare a gauge from some convenient mathematical curve, nothing has ever been accomplished. The standards in use, both in England and America, have originated under precisely the same circumstances, and, although the American is more regular, England will not give up hers nor will the American adopt the Birmingham gauge. And, again, neither—that is the wire workers themselves of the two countries—are willing to entertain any suggestion of a new standard. It seems highly probable that by thorough examination into the "law of resistance," determined from experiments recently made, in connection with the actual reduction, or, perhaps, the "ratio of reduction" of area in drawing to different sizes, some results might be obtained which would lead to a more sensible basis for the foundation of a standard than any yet considered.

### REMARKS

We have seen, in the course of the foregoing treatise, that the machinery employed in wire making is for the most part exceedingly simple. In the continuous process, the rapidity with which the finished product can be obtained is more than counterbalanced by the multiplicity of expensive roll-trains, involving, from the very nature of the process, the greatest precision in the adjustment of their velocities of revolution. The great end and object of the careful study of machinery is simplification.

\* The Practical Mechanic's Magazine.

says: It is somewhat startling that, notwithstanding the very languid condition of the industry, there is now greater difficulty in making the furnaces than there was two years ago, when the demand for iron was great. In every iron making district throughout the kingdom puddling furnaces are standing for want of underhands. Diligent efforts to obtain the required help are fruitless. Said one of the South Staffordshire leading iron masters on Saturday last, in giving evidence before the Factory Act Commissioners in Wolverhampton: "It was only yesterday that I was complaining to my manager that he had seven out of my 28 puddling furnaces standing. The man explained that this stoppage was entirely due to the lack of underhands, and that it was impossible to get them. 'I may as well,' he said 'go into Bilston and ask the first man I meet to lend me a £5 note, as go and seek underhands for these furnaces.' Nor (continued the iron master) are things any better in any other department of the iron trade. People have very little idea of the vast difficulties we have to get enough labor." From this, Mr. J. W. Sparrow, iron master, who is a blast furnace and colliery proprietor, as well as the owner of mills and forges, argued that so heavy were the current expenses of English iron masters that, unable to compete with their manufacturing rivals in Belgium, in France and in Germany, they were losing a large amount of trade. Mr. Sparrow would not only desire that there should be no further restrictions upon the age at which boys should begin to labor in the iron works, but he would have the Legislature retract certain of the steps which it has already taken in this direction. Further, he is satisfied that government will have to do so if the business of the country is to be carried on to the country's advantage. He holds that at 13 years of age a boy is not too young to begin as a full timer at the iron works. "The restrictions of the Legislature were," he says, "made much worse by the practice of the operatives, who decline to labor more than eight hours a day." The views expressed by Mr. Sparrow are those of almost every iron master in the kingdom. Nor are they confined to the employers alone.

The puddlers are going before the commissioners and are urging that, subject to a certain educational standard, and also to a certificate as to physical power, boys should be allowed to begin to work in the mills and forges before they are 13. Seeing that this is the cry from iron masters and ironworkers, from hardware manufacturers and from smiths—in short, from all classes and conditions of people employed in the making and manipulating of the useful metals—the Legislature will have to pay some attention to it. Not of necessity does it follow that because restrictions are salutary in the textile industries, they should be enforced in those occupations where the employment is not sedentary. Meanwhile, there are, here and there, instances in which the difficulty of getting enough youthful labor at the iron works is being overcome by the working of eight hour shifts, in which way younger boys can be legally employed. One iron making firm at West Bromwich, in particular, has adopted this plan, and speaks well of it. The Legislature will not be able to retrace their steps to an extent which will sweep into the iron works all the youthful labor that is needed. Iron masters, therefore, must turn their attention with more resoluteness than heretofore to the wide application of machinery to the process of puddling.

**Philadelphia Ships.**—Forty years ago this city constructed a sloop of almost 500 tons for the navy, that is to-day a memorial of the excellent material and workmanship provided here. The Relief was sent to the Antarctic with Wilkes, for her first cruise, and has been around the world twice, served in the Mexican war, been sent to every station repeatedly as a supply ship, and was so employed in the rebellion. At the close of the war she lay for some time in New York. She is now a receiving ship at the Washington yard, and the papers of that city state that "after having cruised more miles than any other ship in the service, she is to-day stauncher than three-fourths of the vessels built within ten years." We cite this one specimen of Philadelphia marine architecture as a compliment to all. It was very honest material and work, and good sound knowledge that made her what she has been and is. Then undoubtedly some astute critic of some port that claims superiority because it opens directly on the sea, decried the ship for not having a steam jacket on her fore-castle, or ensign halliards delayed to the anchor, and exclaimed at the presumption of an inland manufacturing town in building ships, and prophesied speedy loss, and groaned over the prime cost. Whatever the cost, the ship's history shows that it was small and cheap; and the same final argument establishes the wisdom that caused her construction here.—Philadelphia North American.

The fact that our city sewers at the present day are generally badly constructed, and of the poorest instead of the strongest material, will, we think, be conceded by all. But, in addition to such culpable defects, there appears to be a mistaken idea that it is better to build with loose joints, in order to allow the liquid sewage to percolate through the subsoil. How the latter point is regarded in Europe can be best understood by the following extract from a report lately made by a committee of eight of the most eminent civil engineers and professors of England to the British Association for the Advancement of Science, on the subject of the treatment and utilization of sewage. The remarks are very suggestive, and have peculiar force at the present day, as within the past 30 years the number of connections of water closets with the sewers in the principal cities has multiplied tenfold, compared with previous years. The extract is as follows: "The committee made a special investigation into the sewage arrangements of the town of Cambridge, where water closets are general, though not universal. The outlets of all the sewers were found to be under the level of the surface water in the river Cam, so that the sewage is backed up into the sewers for a considerable distance, and the subsoil is constantly saturated with both water and sewage in the lowest parts of the town. As many of the sewers are old and of irregular shape, much escape of liquid into the subsoil takes place. Inquiries were made into the state of some of the water wells belonging to private houses, and it was found they were all contaminated by sewage, owing to their proximity to the sewers in the streets and to the drains on the premises, so much so that the water cannot be used for drinking, but only for washing.

The chief general importance of the inquiry into the condition of Cambridge is the proof thus obtained of the protection of wells, and therefore of subsoil, by the agency of previous street or house sewers constructed in their vicinity; and the sub-committee gave expression to the conviction forced upon it in the course of its inquiries, that all sewers, properly so called (that is to say, drains into which refuse from human habitations is admitted), ought to be constructed of materials which are altogether impervious; and that a separate system of pervious drains, similar to agricultural drains, should be constructed where necessary to dry the subsoil. The sub-committee is of opinion that the further construction of pervious sewers should be prohibited by Parliamentary enactment."



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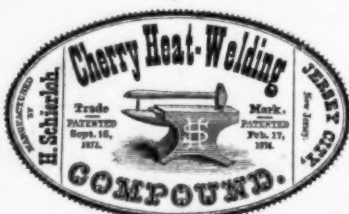


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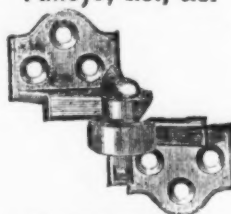
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## The Suez Canal and What It Has Accomplished.

It will be remembered that but a couple of years ago the Isthmus Canal was a sore disappointment to its shareholders. All this is changed now, and the great undertaking has commenced to "pay." The canal has become one of the main arteries through which the world's, and especially Great Britain's, commerce moves. The trade of Europe and the East has within the past five years been virtually revolutionized, as much as it was through the doubling of the Cape of Good Hope by Vasco de Gama, in 1497. In spite of Lord Palmerston's strenuous opposition the canal was dug and the transit successfully established, under the patronage of Napoleon III, and through the devoted labors of Monsieur de Lesseps, who lives to enjoy the fruits of his engineering skill.

If there were anything that could inspire our nation with a vigorous determination to accomplish the piercing of the Isthmus of Panama ere this century be brought to a close, and endow this continent and our Pacific trade with similar advantages, it will be found in an examination of the statistics which the canal company has published up to the beginning of April of the current year.

The canal was thrown open to international commerce with the month of December, 1869, since when, up to April 1, 1875, 5236 vessels made the transit, 2963 passing through from the Mediterranean, and 2373 from the Red Sea. The difference arose from colliers, which left Port Said, but proceeded no further than Ismailia.

Out of the 5236 vessels passed, there were but 238 sailing vessels. This is due to the perilous navigation of the Red Sea, exposed to sudden squalls, while it abounds in dangerous coral reefs.

While during the first month of its inauguration but 10 vessels passed, the first quarter of 1875 enumerates 455. The progression has been most striking:

1870.....	456
1871.....	763
1872.....	1,082
1873.....	1,171
1874.....	1,304

Divided into nationalities, it will be found that Great Britain was represented by 2602 vessels;

France, 416; Austria, 303; Italy, 254;

Turkey, 131; Holland, 123; Egypt, 100; Ger-

many, 95; Spain, 63; Russia, 36; Portugal, 22;

Denmark, 17; Sweden, 15; the United States,

10; Belgium, 9; Greece, 7; Japan, 4; Burmah,

3, and Peru, Tunis and Zanzibar, 1 each.

The small share which the American flag has had in this movement is due to the fact that our main trade from the East is in teas, which England also still receives almost exclusively by clipper; furthermore, we receive a large portion of imports from China, via San Francisco, and single invoices of indigo and silk via Suez and London in British bottoms.

In 1870 the net tonnage amounted to 4,660,000, producing to the company 5,048,944 francs; in 1874 it has reached 1,631,640, producing 24,748,900 francs.

While, from a commercial point of view, the canal has proved one of the most brilliant successes, it has done no less astonishing services in the transportation of troops and Mahomedan pilgrims.

The number of soldiers forwarded by the various nations holding possessions in the East has been the following:

Men.	
Great Britain.....	81,102
Turkey.....	74,738
France.....	30,213
Holland.....	12,371
Spain.....	5,698
Portugal.....	2,347
	205,369

These troops have been principally forwarded

on board of chartered transports, the number

of men-of-war passed having been but 128.

While during 1870 but 4671 pilgrims passed, there were 10,798 forwarded during the first quarter of 1875, against 10,483 in all the preceding year. The company does not expect the number of pilgrims to exceed between 10,000 and 12,000 annually on an average.

Ordinary travelers have ranged as follows:

1869.....	50
1870.....	5,844
1871.....	9,554
1872.....	9,896
1873.....	10,109
1874.....	16,573
January 1 to April 1, 1875.....	4,380
	56,366

Taking the three classes of passengers together there passed 307,779 persons.

The dividend paid to shareholders at present slightly exceeds 5 per cent. annually. Two years ago the shares stood less than 60 per cent. of the capital paid in, while they now command between 30 and 40 per cent. above par value.

As regards the canal dues, several modifications have taken place. While to the 1st July, 1873, 10 francs per ton were charged on the ship's register tonnage, the dues were reckoned on the British gross register tonnage thence to the 29th April, 1874, since when the dues have, through international agreement with the company, been brought back to the net tonnage, taking the new British register ton for a basis. By way of indemnifying the company for this so-called "Moorson system" of measurement, an extra tax of 3 francs per ton has been granted it, to be charged up to the time the annual net tonnage shall have reached 2,200,000 tons, when the extra tax is to be reduced by half a franc, and so on half a franc for every 100,000 tons additional, till 2,600,000 tons per annum are reached, when the extra tax will cease to be collected. This extra tax does not apply to men-of-war and military transports, which pay 10 francs only, and this is one of the reasons why the canal is so extensively availed of for the transportation of troops.

The company's current expenses not amount-

ing to 5,000,000 francs per annum, it can be easily perceived that within a couple of years, at the rate of increase which has hitherto taken place, this will prove one of the most paying enterprises which can be shown the world over. Improvements the company do not contemplate at present. Eventually, when they can afford to be more liberal, these may be indulged in. At all events, the conditions they have been able to obtain through international treaty now prove in practice even more favorable than the original ones of their own establishing, and everything seems to combine to forward their interests. The only difficulty which might arise and stop the transit for a while would be a war between the leading maritime powers of Europe, or between Turkey and Egypt. Although the canal's neutrality may have been internationally guaranteed, it is not likely that the same would be respected.

Meanwhile we repeat that Eastern trade has been revolutionized, much to the benefit of England, and London in particular, whither the bulk of goods are shipped, and whence they are forwarded. The quantity of drugs and dyes formerly sent to the Continent has in great part been diverted to London through the canal, and the auctions there are becoming more and more important.

## The Railroads and Cheap Coal.

Of 52 blast furnaces in the Lehigh Valley, 33 are out of blast. In the Schuylk and Susquehanna valleys the proportion of furnaces now idle is about the same. These are facts which may well arrest attention. Undoubtedly a principal cause for so great a stagnation in the anthracite iron trade is the decreased demand for iron; but undoubtedly also another leading cause is the high price of coal, which prevents furnace owners from making iron at a profit. We will not say that coal is too high in price at the mines, but it certainly is when delivered at the furnace; the railroads charge altogether too high rates for transportation. Here is where the trouble is, and until the railroads reduce their charges the iron industry in Eastern Pennsylvania must continue to suffer from greater depression than afflicts other iron districts. Upon this subject the New York Railroad Gazette, of the 17th inst., holds the following sensible opinions, which we commend to the serious consideration of Eastern Pennsylvania railway officials:

"Railroad companies, unless their lines are unsettled or half settled States, should keep in mind that the increase in their traffic will come hereafter in a larger and larger proportion from manufactures. The agricultural traffic will grow, but the other traffic will grow faster.

"The railroad companies are only less interested than the coal owners themselves in the opening and economical working of the mines and the cheap transportation of their product. This is especially true in those districts where manufacturers are springing up. Possibly the present population will have to depend wholly upon one fuel and one railroad for its supply, and both miners and carriers can be sure of a large profit on the existing coal business. But, though a considerable difference in the cost of the coal, whether caused by charges of the miner or the carrier, may have a slight effect on domestic consumption, it may easily decide the question of the future growth of the towns on the line. That growth must come chiefly from new manufacturers, and the manufacturers, having a choice of lines and locations, will often be compelled to select that place where their expenses will not be increased by high charges for fuel.

"There are some industries, doubtless, for which railroads could well afford to carry their coal even when forming a very large traffic, for bare cost, rather than have them established on other lines. The three or four thousand people brought together by the great manufactory will probably afford a greater and a much more profitable traffic than all that of the manufactory itself.

"This country is favored with the most extensive coal fields in the world, a large part of which we have just begun to work. The growth of the country and the nature of that growth render it probable that the coal mining industry will increase much faster than the average increase of the national industries; and its growth must inevitably add greatly to the traffic of the railroads, which, on the other hand, can do much to hasten the development of this industry, and with it very many other important industries which require a cheap and abundant supply of coal."—Bulletin Iron and Steel Association.

According to the Journal of the Telegraph, the insulation of lightning rods is a grave error, because the insulators to some extent arrest the flow of currents of rarefied electricity, and the insulator amounts to nothing as a barrier against a discharge of lightning, which can either pass through it or leap the short distance between the rod and the building. Insulators, strictly speaking, are no non-conductors, but that term is applied to substances which conduct very imperfectly, and are subjected to violent disruptive effects when a shock of electricity passes through them. To prevent a discharge from leaving the rod and passing through the building, something more must be done than to attempt to keep it out by erecting such flimsy and insignificant barriers. The rod must be arranged so as to present points for the reception and discharge of electricity at the extremities of the building, both above and below, and the different terminations in the ground must be connected by rods lying across the roof, so that lightning can be provided with a path in a horizontal direction, which, being continuous, will be preferred to any series of detached masses of conducting matter contained within the building.



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**Steam Boilers,**  
**Tanks,**  
**Heaters,**  
**Stacks, Pipe,**  
And all Wrought Iron work made to order.  
ESTIMATES GIVEN ON CONTRACT WORK FOR FUR-  
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A Liberal Discount on Boilers to  
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Prices given on application. Address,  
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Miners and Manufacturers of Welsh's  
**Celebrated XX Mineral Facings**  
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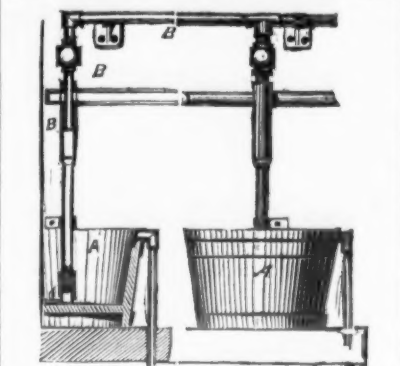
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**Sash Weight Manufactory**  
Bedford Ave. cor. Wallabout St., Brooklyn, N. Y.  
Large stock constantly on hand of both Solid and Wire  
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lowest market prices.

**SPRAGUE SASH WEIGHT CO.,**  
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Orders solicited from all parts of the country

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YOUNGSTOWN, OHIO,  
Manufacturers of  
**SPRAGUE'S IMPROVED**  
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Orders solicited from all parts of the country

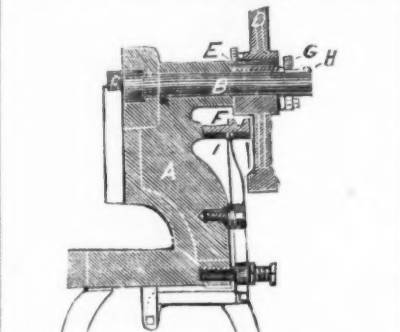
**Orders solicited from all parts of the country**

**New Patents.**  
We take the following abstract of new pa-  
tents, issued June 22, from the official record:  
**APPARATUS FOR TEMPERING FILES.**  
To Wm. T. Nicholson, Providence, R. I.—In-  
jects cool air into the incoming stream of tem-  
pering material, and through a distributor



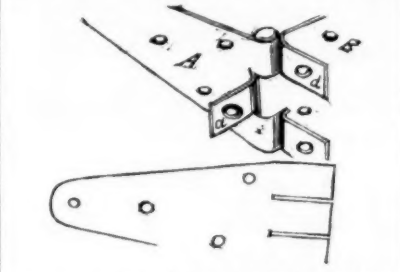
(which may be a perforated bulb) at the bot-  
tom of the vat.  
1. The combination of an air pipe, B, whether  
with or without a distributor, C, and a vat, A,  
containing a hardening solution, whereby the  
particles of the solution are kept in constant  
agitation to produce uniformity of temperature  
and quality.  
2. The combination of a vat, A, for con-  
taining a bath for hardening heated steel  
articles, the pipe, B, for conveying a stream of  
air, and the pipe, B', for containing a stream of  
hardening solution, said pipes having a com-  
mon discharge, B', into the vat, A.

**CLUTCH FOR POWER PRESSES.**  
To A. H. Merriman, West Meriden, Conn.—A  
shaft, having thereon a fly-wheel and clutch  
collar, the fly-wheel loose and the clutch collar  
keyed to the shaft. A pin passing through the

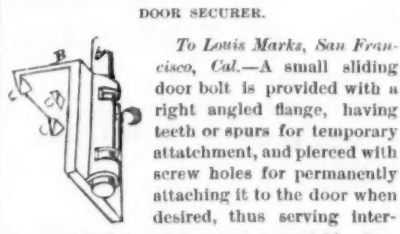


hub of the fly-wheel, to connect it with the  
clutch collar, is operated to and from said  
collar by a guide suitably grooved by means of  
a spring lever and treadle.  
In a press, substantially as herein described,  
the wheel D, sliding pin E, collar G, key H,  
guide plate F, bracket I, plate J and spring  
treadle.

**SHEET METAL HINGE.**  
To Samuel Scott, Springfield, Ohio.—In a  
sheet metal hinge that portion of one of the  
leaves which is ordinarily cut away to make



room for the hub of the other leaf is bent out,  
and utilized to form a rigid arm or auxiliary  
leaf, standing at or near right angles to the  
main leaves, preventing wastage, and materially  
strengthening the hinge.  
As a new article of manufacture, the sheet  
metal hinge composed of the leaves A, B, and  
provided with one or more wings, d, bent out  
from the leaf or leaves, and standing at near  
right angles thereto.



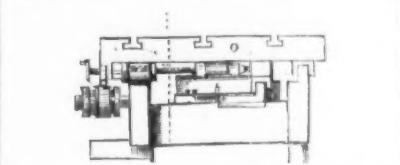
**DOOR SECURER.**  
To Louis Marks, San Francisco, Cal.—A small sliding  
door bolt is provided with a  
right angled flange, having  
teeth or spurs for temporary  
attachment, and pierced with  
screw holes for permanently  
attaching it to the door when  
desired, thus serving inter-  
changeably for a fixture or a portable door  
securer.  
The sliding bolt A, in  
combination with the  
flange or plate B, pro-  
vided with spurs c, e, and  
with means for perman-  
ently attaching it to the  
door, if desired.

**WRENCH.**  
To James Norton, Mid-  
dlebury, Vt.—The handle  
of the wrench is provided  
with an oil reservoir,  
valve and outlet, and the  
stationary and movable  
jaws attached by means  
of dovetail connections  
and screws.  
1. The combination of  
the wrench handle A with  
interior oil chamber B,  
having passage b, the  
screw J, with valve a, and  
the outlet d.  
2. The stationary head E, provided with a T-

shaped or dovetailed groove, fitting over the  
end of the stem, the two parts secured by  
means of a screw, D.

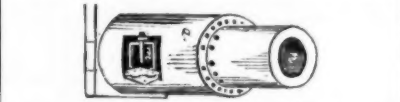
**MACHINE FOR PUNCHING ROILER PLATES.**  
To De Witt C. Carroll and David Rogers, Pitts-  
burgh, Pa., and Alex. W. Foster, Jr., Tempe-  
ranceville, Pa.—Table, supported by the side  
pieces through the medium of swiveled blocks  
and rolls, has a rack on one edge, meshing with  
box-pinion, which latter is spined to the shaft,  
and is free to slide thereon as it may be im-  
pelled by the rack when the bed is moving in  
a circle. Table is guided by the parallel way,  
and an adjustable way placed oblique thereto,  
and the point at which the table is arrested for  
the descent of the punch is indicated by a rack  
bar oblique to the ways, and a long pawl that  
co-operates therewith; and in order that the  
rack bar and pawl may be made to indicate dif-  
ferent orders of intervals between the holes to  
be punched, the pawl is made long and capable  
of adjustment to different angles to the rack  
bar, it being hinged to the end of an arm, which  
at the other end is swiveled to an adjusting  
screw.

1. The feed table D and the driving mechanism  
for imparting to the table a forward motion on  
the main guide rail, in combination with a  
guide attached to said table, and playing on an  
inclined guide rail for giving the table a swing-  
ing motion in its forward travel.



2. A pinion, moving laterally on its driving  
shaft, in combination with a toothed rack and  
horizontally swinging feed table.  
3. A toothed rack bar, fixedly secured in  
place, in combination with a pivoted pawl,  
whereby the angle of the engaging edge of the  
pawl with the line of the rack teeth may, by  
the adjustment of the pawl, be varied at plea-  
sure.  
4. The vertically swinging pawl h, attached  
to, and in combination with, a horizontally  
swinging block, g, and with suitable devices  
for setting the latter at any desired point of  
adjustment.

**STEAM BOILER.—REISSUED.**  
To Martin W. Shapley, Binghamton, N. Y.—  
The horizontal and vertical flues are readily

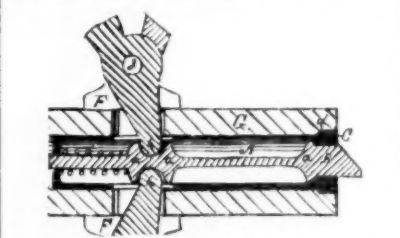


cleaned by removing the detachable flue sec-  
tion.

1. The combination of the boiler, constructed  
substantially as described, and the conical fire-  
box, with the cross and upright tubes and  
jacket and chamber.

2. The combination of the boiler composed  
of parts a, a', and the cross and upright tubes  
opening into the chamber c, with the removable  
jacket, whereby the tubes may be quickly and  
easily cleaned by removing the jacket.

**LATCH FOR DOORS.**  
To O. W. Stow, Plantville, Conn.—1. The  
latch bolt B and its casing A, recessed at the



side in combination with the twin handles E h  
and D, the latter of which is stationary, and  
the former hung on a vertical axis, its outer  
arm E swinging laterally to and from its fellow  
and its inner arm h within the recess at the  
side of the casing.  
2. The barrel A, having the square end plate  
d, in combination with the latch bolt B and its  
fastening plate C, having the hole, e, which fits  
within the mouth of the barrel.

**British Iron in 1875.**

The first half of this year was a period of  
considerable depression in the iron trade. Not-  
withstanding that prices had reached a lower  
level, there was but little revival of demand,  
while, owing to the comparatively high prices  
demanded both for coal and pig iron in the  
earlier months of the year, the production of  
manufactured iron was carried on under great  
disadvantages, and in many cases at an actual  
loss. This condition of things was modified to  
some extent toward the end of the half year by  
the moderate prices ruling for coals and pig  
iron. In Wales there was a strike of colliers,  
which, beginning on New Year's Day, did not  
terminate till the end of May, when the men at  
last gave way, and submitted to a reduction in  
wages of 12½ per cent. The loss to that dis-  
trict was enormous, and no doubt precipitated  
the fall of the Aberdare and Plymouth com-  
panies. In North Wales and North Stafford-  
shire there have been strikes, also, but only of a  
few days' duration, as the men very wisely  
agreed to submit the question of a reduction in  
wages to arbitration, the result being a reduc-  
tion of 10 per cent.

The course of prices was almost steadily  
downward, but the greatest fall was in Scotch  
g. m. b. pig iron, which receded from 76 6 on  
1st January to 57 9 on 9th June. Afterward  
there was a rally to 60 6, which was the closing  
prices at the end of the half year. Middles-

brough pig has arranged between 61 and 51/  
for No. 3, the lowest figures being current at  
30th June. There was no change in the leading  
brands of South Staffordshire iron between the  
8th October, 1874, and 8th July, 1875, but on  
the latter date a reduction of 20 per ton was  
announced. During the same period the fall in  
prices of other makes of bars, hoops, sheets,  
&c., was 25 to 35 per ton, so that the late re-  
duction in leading Staffordshire brands still fails  
to bring prices of the higher descriptions down  
to as low a level as the productions of other  
manufacturers.

The fluctuations which have taken place dur-  
ing the last few years, both in the demand and  
prices, will be manifest on reference to the few  
figures which follow:

Scotch G. M. B.		Welsh Bars.		Leading			
Pig Iron.		f. o. b. Liver-		pool.		South Staf-	
High-est.	Low-est.	High-est.	Low-est.	High-est.	Low-est.	High-est.	Low-est.
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1871. 3 13 0	2 11 6	8 15 0	6 15 0	10 15 0	8 15 0	8 15 0	8 15 0
1872. 6 17 0	10 3 12	6 13 0	5 10 15	10 15 0	8 15 0	16 15 0	10 15 0
1873. 7 5 0	10 5 13	0 13 0	10 11 10	16 15 0	12 15 0	16 15 0	12 15 0
1874. 5 9 0	10 3 11	6 12 0	8 15 10	14 15 0	11 15 0	14 15 0	11 15 0
1875. 6 16 0	10 2 11	9 8 15	8 5 5	11 15 0	10 15 0	11 15 0	10 15 0
TOTAL EXPORTS OF IRON AND STEEL FOR							
FIRST SIX MONTHS OF							
Tons. 1,140,195 1,674,708 1,532,067 1,171,720 1,156,180							
EXPORTS OF RAILS TO UNITED STATES FOR							
FIRST SIX MONTHS OF							
Tons. 241,784 250,011 120,468 64,969 15,734							
TOTAL EXPORTS OF PIG IRON FOR FIRST SIX							
MONTHS OF							
Tons. 454,443 677,384 634,745 319,898 432,599							
EXPORTS OF PIG IRON TO GERMANY AND							
HOLLAND FOR FIRST SIX MONTHS OF							
Tons. 182,526 311,684 336,611 146,366 202,682							

It will be observed from the foregoing figures  
how serious was the falling off in the total ex-  
ports of iron and steel between the years 1872  
and 1874, the difference being equal to 1,000,000  
tons per annum, or about one-sixth of the  
whole make of pig iron in Great Britain. The  
falling off was almost exclusively in the ship-  
ments of pig iron to Germany and Holland, and  
rails to the United States, as shown above.  
The demand from other countries having rather  
increased, it is to the Continent of Europe and  
America that we must look for any demand  
sufficient to affect the iron trade to any ap-  
preciable extent. It is satisfactory to note that  
there is a slight increase in the shipments of  
pig iron during the first six months of this year,  
as compared with 1874, and this would seem to  
indicate that the current of trade is about turn-  
ing, and that more confidence is now felt in the  
present prices of English iron.

An important feature in connection with the  
iron trade during the last two or three years is  
the fact that, notwithstanding the serious fall-  
ing off in the demand, there has not been any  
great accumulation of stocks. This is due in a  
large measure to the labor difficulties which  
have seriously interfered with production, this  
being most manifest in Scotland and Stafford-  
shire. In the North of England (Middlesbrough  
district) the stock in makers' hands at 30th  
June was declared to be 111,444 tons, against  
80,737 tons on 31st December, 1874. In Scot-  
land the stock in stores and makers' hands on  
30th June was estimated to be about 205,000, as  
against 120,000 tons on 25th December, 1874.  
These together represent 316,444 tons, as against  
the following figures at 31st December:

1870.....	742,345 tons	1873.....	200,338 tons
1871.....	558,331 "	1874.....	161,000 "
1872.....	235,028 "		

All the reports from foreign markets seem to  
indicate that, with the single exception of the  
United States, there are no large stocks of iron  
abroad, so that when prices are supposed to  
have reached a minimum, we may look for a  
considerable revival in the demand.

The future course of prices must be ruled  
to a considerable extent by the labor question.  
Already there are indications that the late prices  
of pig iron are unprofitable, and already pro-  
duction has in consequence received a slight  
check. This will be manifest when it is re-  
membered that the lowest prices reached this  
year for Scotch and Middlesbrough pig iron  
are within about 5/ of the average prices ruling  
during the years 1867, 1868, 1869 and 1870,  
whilst wages are now about 20 per cent. higher  
than during that period. Whilst it is not im-  
possible that wages will fall to the old standard,  
it is manifest that there will be great difficul-  
ties in the way of further reductions, as the  
men assert, through their leaders, that present  
wages are worth no more to them than those  
paid some years since, and that the present  
scale ought to be the minimum.

There has already been a very considerable  
fall in the price of coal, but owing to the enor-  
mous production consequent upon the opening  
out of so many new collieries, it seems highly  
probable that coal will soon be as low as it was  
previous to the late advance, but it must not  
be forgotten that the cost of getting coal has  
been considerably increased by the Mines' Reg-  
ulation Act, whilst the general working ex-  
penses are also greater. This increase is esti-  
mated by competent authorities as equal to  
about 2 per ton. Assuming, therefore, that,  
for the present, at least, pig iron has about  
touched cost of production, the makers of man-  
ufactured iron will only be enabled to reduce  
their prices through any relief they may obtain  
in the price of coal or in the wages of puddlers  
and millmen, as it is generally admitted that  
the present prices of manufactured iron are  
about as unremunerative as any other branch  
of the trade.—*Liverpool Daily Post.*

The Greenup (Ky) Herald says: Work at  
Charlotte Furnace is pushed ahead vigorously.  
The old inwall and hearth have been taken out  
and the remodeling of her inwardness to sensi-  
ble proportions has been commenced. The old  
inclined hoist will be replaced by a perpendicular  
hoist.



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IMPORTERS, MANUFACTURERS AND DEALERS IN  
**IRON AND STEEL,**  
HORSE SHOES, HORSE NAILS,  
NORWAY NAIL RODS,  
NAILS, SPIKES,  
"Standard Taper" Axles & Swedes Iron.  
WINDOW GLASS,  
Wrought Iron Pipe and Boiler Tubes,  
bolts, Rivets, Nuts, Washers, and Heavy  
Hardware Generally.  
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Iron and Nail Works Co.,  
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Clays, Slags & Coal for Practical Metal-  
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J. BLODGET BRITTON.

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of a number of practical Iron-masters, expressly to afford  
prompt and reliable information upon the chemical com-  
position of the substances above mentioned, for melting  
and refining purposes. The object being to make it at  
once a convenient, practically useful, and comparatively  
inexpensive adjunct to the Furnace, Forge and Rolling  
Mill.

**CHARGES TO IRON WORKS.**  
For determining the per cent. of Pure Iron in an  
ordinary Ore..... \$4 00  
For the per cent. of Pure Iron, Sulphur and Phos-  
phorus in do..... 12 50  
For each additional constituent of usual occur-  
rence..... 1 50  
For those of unusual occurrence or difficult to de-  
termine, the charge must necessarily depend  
upon circumstances.  
For determining the per cent. of Sulphur and Phos-  
phorus in Iron or Steel..... 14 00  
For each additional constituent of usual occur-  
rence..... 6 00  
For the per cent. of Carbonate of Lime, and in-  
soluble Silicious Matter in a Limestone..... 10 00  
For each additional constituent..... 2 00  
For the per cent. of Water, Volatile Combust-  
ible Matter, fixed Carbon, and Ash in Coal..... 12 50  
or determining the constituents of a Clay, Slag,  
Coke, or of an Ash of Coal the charges will correspond  
with those for the constituents of an ore.  
For a written opinion or letter of instruction the charge  
must necessarily depend upon circumstances.  
Printed instructions for obtaining proper average sam-  
ples for analysis furnished upon application.

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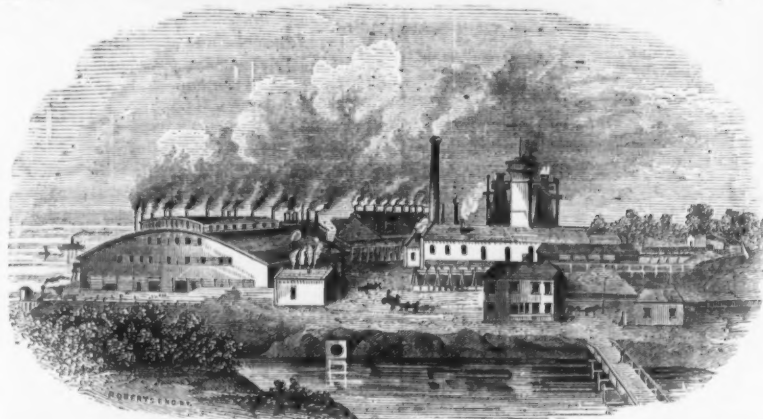
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**ENGLISH & ATLANTIC SCREWS,**  
both Iron and Brass, Flat and Round headed,  
and keeps his friends well supplied from his rather than  
his competitors as to his ability to supply them.  
Also a Stock in bond for Export.

**STEAM PUMPS**  
Manufactured  
by  
CRANE BROS.  
MFG. CO.,  
Chicago.

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**MILWAUKEE IRON CO.,**



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From 30 to 65 Lbs. per Yard.

Re-Rolling done on short notice.

**PIG IRON.**

BEST No. 1 FOUNDRY IRON constantly on hand and for sale in car-load or larger lots, at  
lowest market price.

**Merchant Bar Iron.**

A FULL ASSORTMENT—SUPERIOR QUALITY.

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**Potter, Hoffman & Co.,**  
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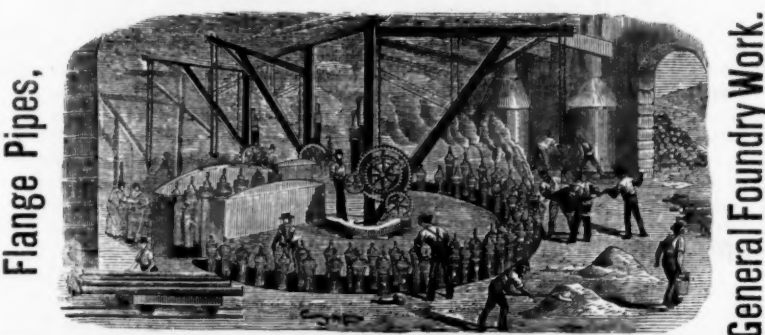
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Crucible Steel Tires, Axles, Forgings,  
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FOR LOCO TRUCK AND TENDER  
PASSENGER CAR SERVICE

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PROPRIETORS OF THE  
**Pottsville Rolling Mills & Pioneer Furnaces**  
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Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their  
Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to  
produce

**RAILROAD IRON**

Of uniform quality, unsurpassed for strength and wear, and of any required length.  
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**ALL DESCRIPTIONS OF IRON RAILS**

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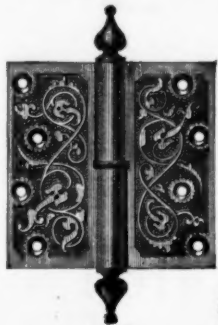
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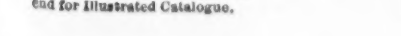
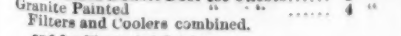
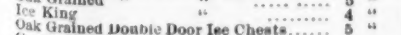
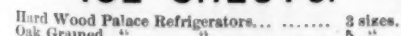
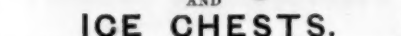
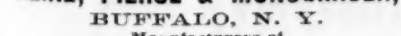
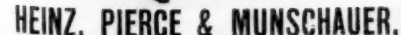
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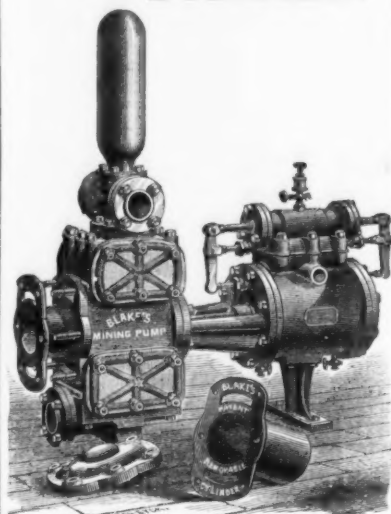
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The manufactory of Messrs. Yates, Haywood & Co. has this advantage over most other buildings of the like nature in and about Rotherham—that it has a handsome exterior. It is, it is true, apt to escape the notice of a stranger, owing to its out-of-the-way situation, but once seen it will be sure to excite a keen interest. You are first struck by its remarkable length, and by the extraordinary number of windows, "Let there be light" is a command which is literally obeyed at the Edlingham Works. Of course, the building is of brick, and equally of course it has to some extent been begrimed by smoke. Still it is by no means unplesing to the eye; indeed, the style is so regular and compact that you are apt to imagine you are in front of an extensive hospital or military barracks, instead of a manufactory. The interior is equally prepossessing. In the rooms where the lighter branches of the business are carried on everything is neat and clean. Wandering about in the great yards you discover that there are three large separate blocks of buildings, as well as many small isolated workshops. But, before you are at liberty to make any such peregrination, you must have the permission of the proper authorities. The entrance to the manufactory is by a gate, which is well guarded. Let us now describe the visit which we ourselves paid to the works, and record our impressions. Our guide met us at the keeper's lodge, and conducted us straightway up a flight of steps and into a small room in which are kept a quantity of wax models. These models are the work of ingenious artists, and are very beautiful to look on. They are meant as the groundwork, so to speak, of the higher class of ornamental articles. The design is first drawn on paper, then reproduced in clay, and then modeled in wax. In the little room in which we now stood an artist is sometimes employed, but on this occasion such was not the case. Passing along a narrow corridor we came to a larger apartment wherein we found the lead models. The wax model of the article to be manufactured is cast in lead to begin with, and is then cast in more durable metal. One figure of the design only is necessary, any number that is required being afterward easily produced. In the lead chasing department—where the finishing touches are given to the lead castings—there were several men and boys at work at benches, scraping and paring as it seemed to us, but in reality dexterously engaged in delicately freeing the castings from blemishes which might deface the articles to be manufactured from them. Lying about the room, too, were many complete lead castings—in particular, one of the new "Edlingham stove," which sends the hot air into the room instead of allowing it to escape up the chimney to no purpose. Ascending another flight of stairs we came to the workshop where the wood modelers were busy in making models for the commoner kind of ware. This was a lofty, well lighted apartment, and the artisans at the benches were intelligent looking men, who are said to earn good wages. The mold flasks' shop was next visited, and was—as might be expected—somewhat less free from dust. After the metal models are complete they are carried here to have their edges and surfaces pared and polished, in order that the duplicates which are taken from them may be in every way satisfactory. Our guide pointed out to us in this room a metal model of a compact "cabin stove" on a novel principle, as well as many other articles of a most ingenious character. In an adjacent room we were shown some curiously formed little iron tables, which are meant for an advertising company. The tops are to be covered with advertisements, over which a sheet of thick glass will be placed. You can at pleasure turn these tops round and round, and so may read all the advertisements without trouble. It is apparently intended to lend out the tables to hotels, cafes, &c. From this room we proceeded to the brass-chasing shop, where the brass goods are polished, garnished and burnished, and thence we passed into the bronzing shop. In both these departments the number of men employed was small. A noticeable feature of the Edlingham Works is the vast quantity of rooms. There are some large workshops, of course, but the rule seems to be to have as many separate rooms as possible, so that the different artisans may pursue their avocations undisturbed. A stranger is totally unable to carry away a connected idea of the whole of the processes—so numerous are they. "The manufacture of these articles is so simple it is hardly worth describing," we were told before making our visit. Our impression after leaving the works was that the manufacture is so intricate that it is hardly possible to describe it comprehensively. There are so many "branches" and "departments" that if we were to attempt to enter into details concerning them all the reader would be hopelessly bewildered.

In a small room remote from the noisy part of the manufactory we came upon a couple of gentlemen engaged in making drawings of the newest stove grates and ornamental articles. These drawings are for the use of the firm's travelers by whom they are exhibited to buyers throughout the kingdom. While on this head we may say that we discovered later on that the firm has its own lithographers at the works by whom the books of designs and patterns are prepared. Passing by the tinner's shop, where the tinware for kitchen utensils is made, we came to the fender-maker's shop—an extensive apartment, around the walls of which were ranged broad benches. Fenders of all descriptions—from the common one of the cottage to the grandly ornamental one of the man-

sion—are here produced. The number of men in the shop was greater than we had yet met with in any one room, and altogether there were more bustle and noise. The center of the room was occupied with a collection of fenders, some of which struck us as being extremely handsome. Near the fender-maker's shop is the rubbing-up shop, which plays a highly important part in the completion of the best goods. When the "fitters" have put the articles together—at is, have joined all the different parts of a piece of work—it is the custom to separate them again and to have them filed and finished in this room. In the kitchen-fitters' shop, to which we were next conducted, cooking stoves of every kind are made. We were shown all manner of ingenious contrivances for facilitating the great operation of cooking. The "single gentleman" in "The Old Curiosity Shop," who astonished Mr. Richard Swiveller by cooking a beefsteak in a machine of wonderful construction, which at the same time boiled hot water for the purpose of rum punch, might here himself find food—or, rather, the means of cooking food—for astonishment. Leaving this collection of stoves behind us, we descended a flight of stairs, and entered what is called the register fitting shop. Here it is that the encaustic tiles—made by the firm of Minton, at Stoke-upon-Trent—are fitted into the front of the stove. These tiles are some of them of beautiful design, and are, of course, only used for the ornamentation of stoves for which a very high price is charged by the dealers. One by one the tiles are inserted in a frame-work of iron until the face of the stove assumes a positively splendid appearance. The next shop to this was occupied by the "buffers," whom we were curious to see on account of their rather uncommon designation. We found that the name "buffer" was not applied to the workmen themselves, but to their tools. It is their business to polish the articles to the requisite degree of brightness, and this is done by means of pads of leather attached to rapidly revolving spindles projecting from wheels. The article to be polished is held tightly against the leather pad, and in this way effectively and expeditiously brightened. In an adjoining shop a rougher process of brightening is carried out, soft stone wheels being here employed instead of leather pads. The workman leans over the wheel as is done in knife grinding, and the article to be brightened is held against it. We were now taken to a room in which we were shown some exquisite hand painted encaustic tiles from Minton's manufactory. Many of these tiles were absolute works of art, and worth a large sum of money. The designs were, in the main, tasteful and elegant. None but the very rich, we dare say, could afford to purchase articles adorned with tiles of this beautiful description.

The warehouse, where the goods are packed prior to being dispatched, was our next destination. We reached it after traversing long passages—the works abound in these passages. One splendid stove there was which excited our admiration. It was adorned with costly encaustic tiles, such as we have referred to, and there was about it also a profusion of ornate work. Next we reached the room in which the "black" is burnt on the articles which are intended to be of a sombre hue. They are rubbed with black and then placed in a species of oven where they are allowed to remain until the coloring matter has hardened. The heat in the vicinity of the ovens was intense, but it did not appear to incommode the workmen in the least, for they went in and out without appearing to suffer the smallest inconvenience. Close at hand was the store room, where goods are kept for which there is no immediate demand. We found here a few of the stoves manufactured on the design of Captain Douglas Galtton, and long known by his name. The specialties claimed for these stoves are that they ventilate and heat the room in which they are fixed; maintain a uniform temperature; do away with draughts; economize fuel; and prevent smoky chimneys. Those we saw were of various kinds, and were of many different patterns. There were some for ordinary dwelling houses, some for public buildings, and some for soldiers' barracks. We were shown, too, a veteran article in the shape of the first, or what is supposed to be the first, gas stove manufactured. It lay in honorable retirement in a corner near the door, and was of extremely simple construction. Beyond the store room was an apartment in which the lithographic stones already used were placed on shelves. There were several hundreds of them, and each one bore a number, so that it might be found instantly if required. Going down another flight of stairs we entered a second store room, in all respects like the first, and had our attention directed to a heap of castings, from which the "fitters" make a selection when they are in want of anything to complete a piece of work. The electro bronzing shop, where the metal is embellished, is a little building apart, and was at the time we entered it occupied only by one artisan. The fact is, it was now 12 o'clock, and the men had betaken themselves to their early dinner.

Our guide next conducted us to the foundry, which we have since been told is one of the finest in England. It is a great brick building, with a lofty sloping roof, and is divided into two parts, the cupolas being in the center. At the threshold we were impressed by the glowiness of the interior and the earthy smell which prevailed. The floor was covered with what to our unaccustomed eyes, appeared to be mounds of fine black sand—it sand could possibly be black—from which smoke arose. We soon discovered that under each of these mounds was a "casting." Men were running hither and thither with flaming pots full of molten metal, which they poured into the molds. So spacious is the foundry that we were not at all affected by the heat arising from the numerous black hillocks with which the ground was studded, and the vapors arising from the blazing "castings" speedily escaped through the openings in the roof. Around the cupola—there are two, but only one is in use, the other being merely erected to provide against accidents—were gathered some half-naked men who fed the greedy monster. Beyond this again lay the second section of the foundry, and in an adjacent building we had all the metal models in use pointed out to us. These models—of which there were apparently some thousands—are in the care of a keeper, who gives them out as they are required. We had now seen the most important workshops in the manufactory, but our guide's patience was by no means exhausted. He took us to the "fitter's shop," where the castings are cleaned from sand; to the filing and rubbing shop, where they are further perfected, and to the grinding shop, where they are, if need be, ground. We likewise visited the engine house and boiler house, the smith's shop and a shop in which cast iron kitchen boilers are made; after which we returned to the main building and brought our visit to a close.



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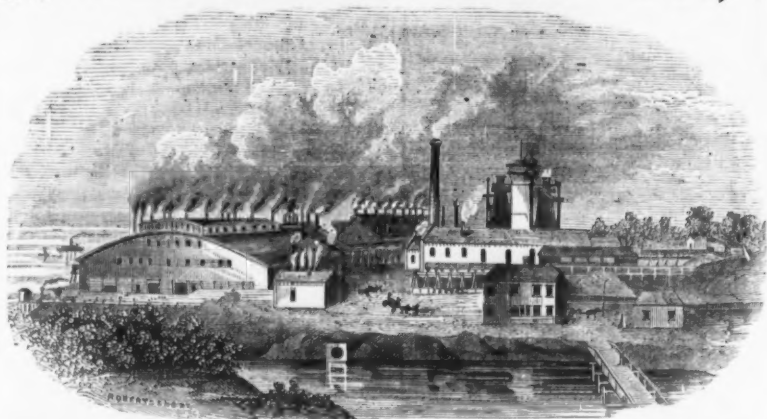
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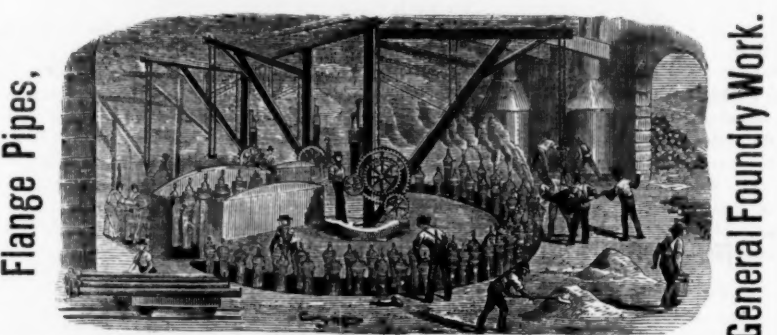
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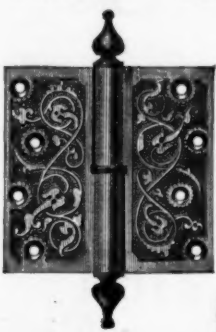
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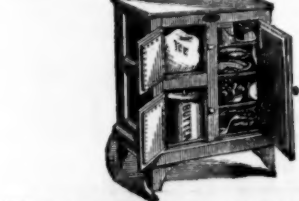
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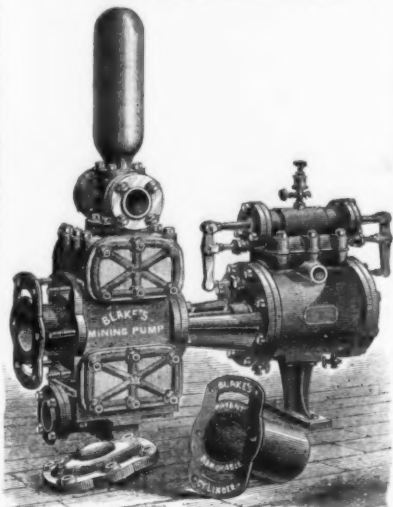
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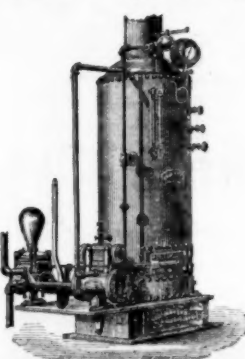
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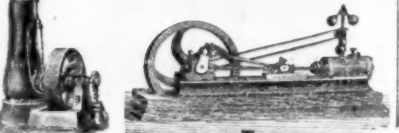
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**An English Stove Foundry.**

The following description of the stove grate works of Messrs. Yates, Haywood & Co., at Rotherham, written by a correspondent on the spot, will be of interest to our readers, as affording a basis of comparison between English and American stove foundries:

The manufactory of Messrs. Yates, Haywood & Co. has this advantage over most other buildings of the like nature in and about Rotherham—that it has a handsome exterior. It is, it is true, apt to escape the notice of a stranger, owing to its out-of-the-way situation, but once seen it will be sure to excite a keen interest. You are first struck by its remarkable length, and by the extraordinary number of windows. "Let there be light" is a command which is literally obeyed at the Effingham Works. Of course, the building is of brick, and equally of course it has to some extent been begrimed by smoke. Still it is by no means unplesing to the eye; indeed, the style is so regular and compact that you are apt to imagine you are in front of an extensive hospital or military barracks, instead of a manufactory. The interior is equally prepossessing. In the rooms where the lighter branches of the business are carried on everything is neat and clean. Wandering about in the great yards you discover that there are three large separate blocks of buildings, as well as many small isolated workshops. But, before you are at liberty to make any such peregrination, you must have the permission of the proper authorities. The entrance to the manufactory is by a gate, which is well guarded. Let us now describe the visit which we ourselves paid to the works, and record our impressions. Our guide met us at the keeper's lodge, and conducted us straightway up a flight of steps and into a small room in which are kept a quantity of wax models. These models are the work of ingenious artists, and are very beautiful to look on. They are meant as the groundwork, so to speak, of the higher class of ornamental articles. The design is first drawn on paper, then reproduced in clay, and then modeled in wax. In the little room in which we now stood an artist is sometimes employed, but on this occasion such was not the case. Passing along a narrow corridor we came to a larger apartment wherein we found the lead models. The wax model of the article to be manufactured is cast in lead to begin with, and is then cast in more durable metal. One figure of the design only is necessary, any number that is required being afterward easily produced. In the lead chasing department—where the finishing touches are given to the lead castings—there were several men and boys at work at benches, scraping and paring as it seemed to us, but in reality dexterously engaged in delicately freeing the castings from blemishes which might deface the articles to be manufactured from them. Lying about the room, too, were many complete lead castings—in particular, one of the new "Effingham stove," which sends the hot air into the room instead of allowing it to escape up the chimney to no purpose. Ascending another flight of stairs we came to the workshop where the wood modelers were busy in making models for the commoner kind of ware. This was a lofty, well lighted apartment, and the artisans at the benches were intelligent looking men, who are said to earn good wages. The mold fliers' shop was next visited, and was—as might be expected—somewhat less free from dust. After the metal models are complete they are carried here to have their edges and surfaces pared and polished, in order that the duplicates which are taken from them may be in every way satisfactory. Our guide pointed out to us in this room a metal model of a compact "cabin stove" on a novel principle, as well as many other articles of a most ingenious character. In an adjacent room we were shown some curiously formed little iron tables, which are meant for an advertising company. The tops are to be covered with advertisements, over which a sheet of thick glass will be placed. You can at pleasure turn these tops round and round, and so may read all the advertisements without trouble. It is apparently intended to lend out the tables to hotels, cafes, &c. From this room we proceeded to the brass-chasing shop, where the brass goods are polished, garnished and burnished, and thence we passed into the brazing shop. In both these departments the number of men employed was small. A noticeable feature of the Effingham Works is the vast quantity of rooms. There are some large workshops, of course, but the rule seems to be to have as many separate rooms as possible, so that the different artisans may pursue their avocations undisturbed. A stranger is totally unable to carry away a connected idea of the whole of the processes—so numerous are they. "The manufacture of these articles is so simple it is hardly worth describing," we were told before making our visit. Our impression after leaving the works was that the manufacture is so intricate that it is hardly possible to describe it comprehensively. There are so many "branches" and "departments" that if we were to attempt to enter into details concerning them all the reader would be hopelessly bewildered.

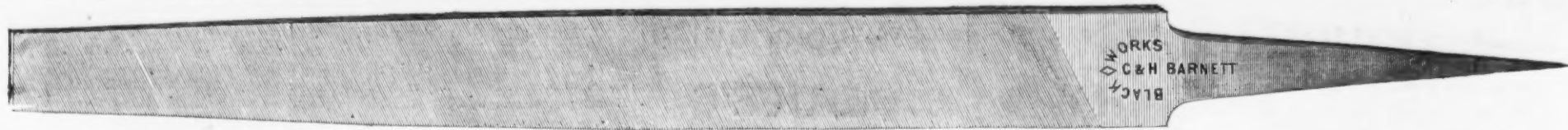
In a small room remote from the noisy part of the manufactory we came upon a couple of gentlemen engaged in making drawings of the newest stove grates and ornamental articles. These drawings are for the use of the firm's travelers by whom they are exhibited to buyers throughout the kingdom. While on this head we may say that we discovered later on that the firm has its own lithographers at the works by whom the books of designs and patterns are prepared. Passing by the tinner's shop, where the tinware for kitchen utensils is made, we came to the fender-maker's shop—an extensive apartment, around the walls of which were ranged broad benches. Fenders of all descriptions—from the common one of the cottage to the grandly ornamental one of the man-

sion—are here produced. The number of men in the shop was greater than we had yet met with in any one room, and altogether there were more bustle and noise. The center of the room was occupied with a collection of fenders, some of which struck us as being extremely handsome. Near the fender-maker's shop is the rubbing-up shop, which plays a highly important part in the completion of the best goods. When the "fitters" have put the articles together—it is, have joined all the different parts of a piece of work—it is the custom to separate them again and to have them filed and finished in this room. In the kitchen-fitters' shop, to which we were next conducted, cooking stoves of every kind are made. We were shown all manner of ingenious contrivances for facilitating the great operation of cooking. The "single gentleman" in "The Old Curiosity Shop," who astonished Mr. Richard Swiveller by cooking a beefsteak in a machine of wonderful construction, which at the same time boiled hot water for the purpose of rum punch, might here himself find food—or, rather, the means of cooking food—for astonishment. Leaving this collection of stoves behind us, we descended a flight of stairs, and entered what is called the register fitting shop. Here it is that the encaustic tiles—made by the firm of Minton, at Stoke-upon-Trent—are fitted into the front of the stove. These tiles are some of them of beautiful design, and are, of course, only used for the ornamentation of stoves for which a very high price is charged by the dealers. One by one the tiles are inserted in a frame-work of iron until the face of the stove assumes a positively splendid appearance. The next shop to this was occupied by the "buffers," whom we were curious to see on account of their rather uncommon designation. We found that the name "buffer" was not applied to the workmen themselves, but to their tools. It is their business to polish the articles to the requisite degree of brightness, and this is done by means of pads of leather attached to rapidly revolving spindles projecting from wheels. The article to be polished is held tightly against the leather pad, and is in this way effectively and expeditiously brightened. In an adjoining shop a rougher process of brightening is carried out, soft stone wheels being here employed instead of leather pads. The workman leans over the wheel as is done in knife grinding, and the article to be brightened is held against it. We were now taken to a room in which we were shown some exquisite hand-painted encaustic tiles from Minton's manufactory. Many of these tiles were absolute works of art, and worth a large sum of money. The designs were, in the main, tasteful and elegant. None but the very rich, we dare say, could afford to purchase articles adorned with tiles of this beautiful description.

The warehouse, where the goods are packed prior to being dispatched, was our next destination. We reached it after traversing long passages—the works abound in these passages. One splendid stove there was which excited our admiration. It was adorned with costly encaustic tiles, such as we have referred to, and there was about it also a profusion of ornate work. Next we reached the room in which the "black" is burnt on the articles which are intended to be of a sombre hue. They are rubbed with black and then placed in a species of oven where they are allowed to remain until the coloring matter has hardened. The heat in the vicinity of the ovens was intense, but it did not appear to inconvenience the workmen in the least, for they went in and out without appearing to suffer the smallest inconvenience. Close at hand was the store room, where goods are kept for which there is no immediate demand. We found here a few of the stoves manufactured in the design of Captain Douglas Galtton, and long known by his name. The specialties claimed for these stoves are that they ventilate and heat the room in which they are fixed; maintain a uniform temperature; do away with draughts; economize fuel; and prevent smoky chimneys. Those we saw were of various kinds, and were of many different patterns. There were some for ordinary dwelling houses, some for public buildings, and some for soldiers' barracks. We were shown, too, a veteran article in the shape of the first, or what is supposed to be the first, gas stove manufactured. It lay in honorable retirement in a corner near the door, and was of extremely simple construction. Beyond the store room was an apartment in which the lithographic stones already used were placed on shelves. There were several hundreds of them, and each one bore a number, so that it might be found instantly if required. Going down another flight of stairs we entered a second store room, in all respects like the first, and had our attention directed to a heap of castings, from which the "fitters" make a selection when they are in want of anything to complete a piece of work. The electro-bronzing shop, where the metal is embellished, is a little building apart, and was at the time we entered it occupied only by one artisan. The fact is, it was now 12 o'clock, and the men had betaken themselves to their early dinner.

Our guide next conducted us to the foundry, which we have since been told is one of the finest in England. It is a great brick building, with a lofty sloping roof, and is divided into two parts, the cupolas being in the center. At the threshold we were impressed by the gloominess of the interior and the earthy smell which prevailed. The floor was covered with what to our unaccustomed eyes, appeared to be mounds of fine black sand—if sand could possibly be black—from which smoke arose. We soon discovered that under each of these mounds was a "casting." Men were running hither and thither with flaming pots full of molten metal, which they poured into the molds. So spacious is the foundry that we were not at all affected by the heat arising from the numerous black hillocks with which the ground was studded, and the vapors arising from the blazing "castings" speedily escaped through the openings in the roof. Around the cupolas—there are two, but only one is in use, the other being merely erected to provide against accidents—were gathered some half-naked men who fed the greedy monster. Beyond this again lay the second section of the foundry, and in an adjacent building we had all the metal models in use pointed out to us. These models—of which there were apparently some thousands—are in the care of a keeper, who gives them out as they are required. We had now seen the most important workshops in the manufactory, but our guide's patience was by no means exhausted. He took us to the "fetting shop," where the castings are cleaned from sand; to the filing and rubbing shop, where they are further perfected, and to the grinding shop, where they are, if need be, ground. We likewise visited the engine house and boiler house, the smith's shop and a shop in which cast iron kitchen boilers are made; after which we returned to the main building and brought our visit to a close.





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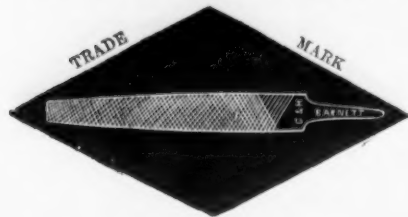
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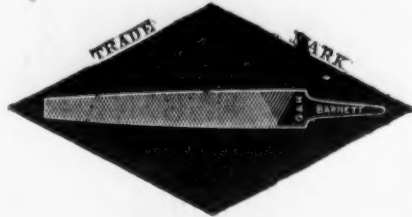
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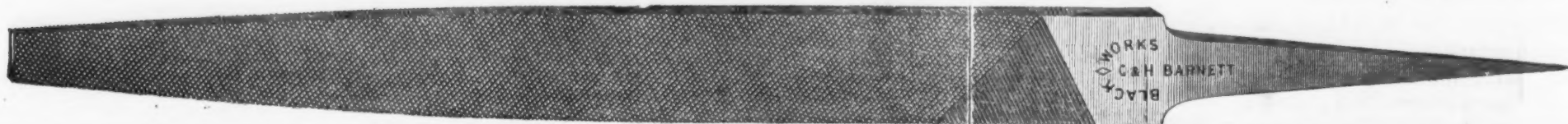
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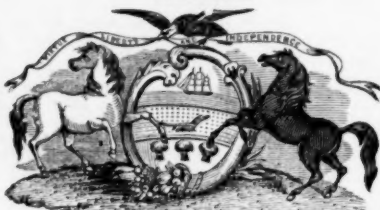
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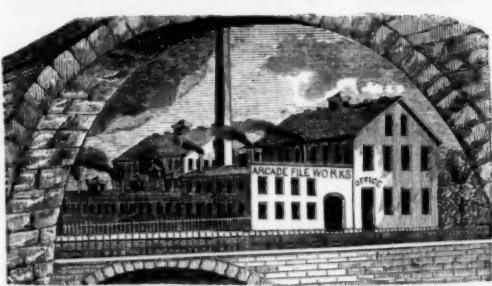
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W. J. Davies' Sons' London Emery Cloth,  
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## AUBURN FILE WORKS,

Superior Hand-Cut

## FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

89 Chambers and 71 Reade Streets, N. Y.

## JOHN ROTHERY'S

## Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

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## FLORISTS' GOODS.

Aquaria, Ferneries, Flower Pot Stands,

FLOWER POT BRACKETS, BIRD CAGE HOOKS, &amp;c., &amp;c.



## BUILDERS' HARDWARE.

Patent Zinc Stove Platforms.

G. WEBSTER PECK,

Manufacturers' Agent.

110 Chambers Street, New York.



CAST STEEL HAMMERS

HARTFORD, CONN.



# HOBART'S TACKS.

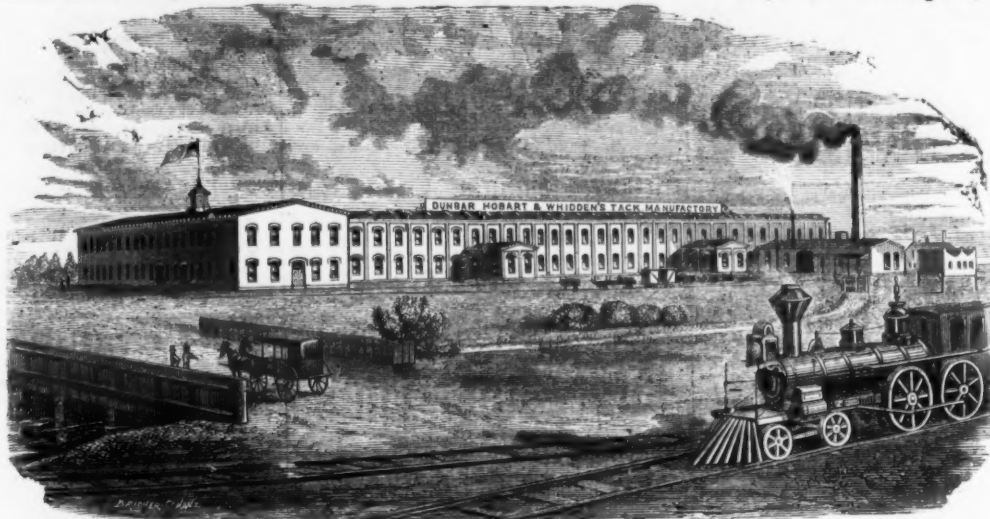
MANUFACTURED BY

## DUNBAR, HOBART & WHIDDEN,

Established 1810.

Office and Salesroom, 116 Chambers Street, New York

Factory, South Abington, Mass.



MANUFACTURERS OF

### American, Swedes and Copper Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners', Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points,

IRON, STEEL, COPPER, ZINC AND BRASS SHOE NAILS,

Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails.

A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and irregular sizes made to order or cut from sample at short notice. Send for Price List.

## Hopkins & Dickinson Manufacturing Co.,

FINE METAL WORKERS,

Works, Darlington, N. J.

69 Duane Street, N. Y.

## Hand Made Locks and Real Bronze Hardware.

NEW AND ARTISTIC DESIGNS FOR

Private Residences, Banks, Churches and Public Buildings.

## OTIS PASSENGER AND FREIGHT ELEVATORS

FOR HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &amp;c.

OTIS BROTHERS &amp; CO.

SOLE MANUFACTURERS,

348 Broadway, New York.

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32 Cliff Street, N. Y.

## METALS.

Anthracite Pig Irons,

COLD AND WARM BLAST CHARCOAL IRONS,

American and English Bessemer Irons, Iron Ores.

COPPER, TIN, &amp;c.

### Advances made on Merchandise.

## AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

Locks &amp; Latches,

Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with

SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, and cannot be affected by rust, and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, they will rival the best made Locks in Finish and perfect operation.

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having thirty-five finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs which cannot be said of any other patent Tumbler Locks in use.

THE LOCKS ARE FITTED TO THE KEYS,

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

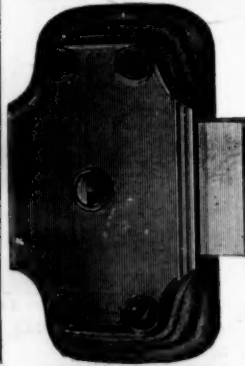
For descriptive list and terms, address

AMERICAN LOCK MFG. CO.,

OFFICE and WORKS, Cazenovia, N. Y.,

Or, UNION NUT CO., Agents,

78 Beekman Street, New York.



FULL SIZE OF KEY.

### BUSINESS ITEMS.

#### NEW JERSEY.

William J. Taylor, president of the North Jersey Iron Company, has applied for a patent upon a new process of calcining iron ore, and is now erecting two calcining kilns at Hedge's mine, Chester.

The new furnace at Hackettstown has been completed, and on Friday the match was applied by Miss Maud Valentine, daughter of Col. Valentine, one of the directors, and the operations of this new enterprise commenced. From twelve to fifteen tons of iron are made daily, about one-half of the capacity of the furnace. In one month, if no misfortune occurs, the furnace will be working to its full capacity. Twenty-six men are employed night and day, one-half alternating weekly.

#### PENNSYLVANIA.

John Roach is building at Chester, on the Delaware, two iron steamers for Morgan's Brashear City and New York line. They are to carry 3000 tons on 10 feet of water, which will take them through the Brashear Canal into the Gulf of Mexico, where the vessels will be water-ballasted down to 13 feet for safety.

The new nut and bolt works of McMurty & Charles, Pittsburgh, are now in full operation, the product of their new improvements and patent machines coming up to expectations.

The forge at Gibraltar, near Reading, is at work.

During the twelve weeks ending July 31, the puddlers of the Western Iron Company's forge at Sharon, under the excellent management of Mr. James Wilks, made 4000 tons of muck bar iron.

D. W. C. Carroll & Co., of the Fort Pitt Boiler and Iron Works, Pittsburgh, have just contracted to manufacture four large boilers and appurtenances for the United States government iron snag boat now being completed. They have also closed a contract to make six large homogeneous steel boilers and other work for the Grand Lake Coal Company, of that city. Both contracts are to be completed by fall.

We learn from the New Castle Courier that the works of the New Castle Iron Company will be transferred to J. B. Bradley & Co. on Monday next. The members of the new firm are J. B. Bradley, Peter Kimberly and Geo. L. and Wm. E. Reis, all men of experience and ability in the iron business.

#### MASSACHUSETTS.

The Putnam Machine Company, of Fitchburg, have just completed an air compressor for the Burleigh Rock Drill Company, to be used at the Gold Hill silver mines in Nevada, which weighs 10½ tons, and will discharge into the mine 1,357,500 cubic inches of free air per minute, which is to be used for running the hoisting engines and Burleigh drills 1500 to 2000 feet below the surface. The compressor was designed by W. W. Bailey, superintendent of the Burleigh Rock Drill Company, and built under the supervision of Mr. John Q. Wright, a superintendent in the Putnam Works. It will be shipped through the Hoosac Tunnel.

There is a prospect of the organization of a stock company for the manufacture of tacks in George Burbank's new steam power building, at Pittsfield. George S. Willis, lately in the business on Church street, is interested in it, and his machinery would be used.

The Sewing Machine Company and the Cutlery Company, at Florence, will start their works on full time again Monday. The Sewing Machine Company are making tools for a new manufacturing machine, to be put into the market soon.

The Watson Company, of Springfield, have just completed their South American contract for 44 freight, 20 construction and 9 passenger cars, and their extensive order for passenger cars for the New Jersey Central Railroad, upon which they have been engaged for about six months, will be filled with one more shipment, about a month hence. They have no other work of importance on hand, but hope to keep their present force of 200 hands until business revives.

#### OHIO.

The Chillicothe Hollow Tooth Harrow Company has changed to the Chillicothe Agricultural Works.

The stack of No. 2 furnace, at the Himrod Works, has been taken down and a larger stack is being erected in its place, by John Hennessy, of the Cleveland Boiler Works, who has the contract. The furnace has a jacket 23 feet 4 inches in diameter. The stack will be 70 feet high.—Youngstown Tribune.

The Cincinnati Brass Works, F. Luckenheimer, comprise a brick building 100 feet long, four stories high, which is supplied with the best labor saving machinery. Forty hands are employed, and the product varies from \$100,000 to \$125,000 per annum.

The Cleveland Rolling Mill Company are carrying out their intention of making steel boiler plate by having erected two Martin-Siemens furnaces, of seven tons capacity each. Their plate mill is already regarded as one of the best in the country, which reputation will be considerably enhanced by the new improvement. Their old bar mill is to be enclosed under a new iron building, which will consume 600 tons of iron.

The Edge Tool Company's building, in Leontonia, is nearly completed. New machinery is being put in to increase the capacity of their works, by the Pittsburgh Hinge and Bolt Factory, located at Beaver Falls. The factory is running to its full capacity, with orders two months in advance.

The Globe Iron Works, at Dayton, Messrs. Stout, Mills & Temple, proprietors, are enjoying a large demand for their celebrated turbine water wheels, from all parts of the world. Within a few days they have made shipments to South America and Mexico, as well as to localities in more than a dozen different States and Territories of our own land.

A knitting machine factory is to be established at Norwalk, by the Curtiss Manufacturing Company, with \$96,000 capital.

ILLINOIS.

About 120 workmen are now employed in the works of the Chicago Plow Company. This is a larger number than has ever before been employed.

The Chicago Shears and Screw Company has been incorporated.

Some time since the Northwestern Horse Nail Company, of Chicago, made important additions to their facilities for manufacturing, and now work an increased force. They sold last year 1000 tons of horse nails.

#### INDIANA.

C. B. Peterson, of the Richmond Stove and Variety Iron Works, has 35 men employed, and the amount of work turned out annually is from \$35,000 to \$40,000, and is increasing from year to year. He makes thirteen different kinds of cook stoves and twenty varieties of heating stoves.

The Eagle Machine Company, Indianapolis, are working night and day to supply the demand for their new Hasselman separator and their portable engines. A large demand for them has come from Southern and Central Illinois and from Indiana.

E. C. Atkins & Co., at the Sheffield Saw Works, Indianapolis, are working a full force, and manufacturing largely of stock for the fall trade. The prospect for an active demand is very encouraging.

The specialty of the Richmond Malleable Iron and Machine Works is the manufacture of carriage and wagon malleables of all kinds, plow and pump castings, brass engine trimmings, steam engines, etc. Fifty men find employment here, and the business is constantly increasing.

Messrs. A. T. Nichols & Co., Indianapolis, have recently shipped a sard papering machine, a ripping or slitting saw and a pair of their matcher heads to Hamburg, Germany. All of these machines are of their own manufacture, and are meeting a rapid sale in all parts of this country.

Messrs. Mack & Co., Successors to D. R. Barton & Co.

About the year 1832 the manufacture of edge tools was commenced in Rochester, N. Y., by the late D. R. Barton, of that city. In 1866, Messrs. Mack & Co. purchased a two-thirds interest in the business, and erected the present commodious factory buildings. These are substantial structures, and well adapted to the purposes of manufacture, being built of limestone, some of them three and four stories in height, and occupying 3½ acres of ground.

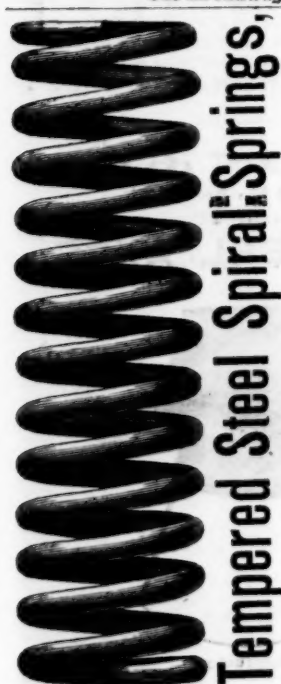
On the 12th of February, 1874, in accordance with an agreement entered into between the partners, Mr. Barton retired from the firm, disposing of his interest in the business and in the trade mark, "D. R. Barton & Co.," to Messrs. Mack & Co., the present concern, who occupy all the buildings formerly used by the original firm, and have in their employ most of the men engaged in the manufacture of the goods known by the trademark "D. R. Barton & Co.," many of them having made the same class of goods for thirty years.

Since their first connection with the business, Messrs. Mack & Co. have given it their entire attention, and are now, as heretofore, determined to manufacture none but goods of the best quality, both as regards finish and style. To insure this every article is inspected before leaving the works, and fully warranted. The material used is the finest quality of imported steel, manufactured by Thos. Firth & Sons and Wm. Jessup & Sons, of Sheffield, England.

**Perpetual Motion.**—The *Lumberman's Gazette* says: Notwithstanding the failure of ages of experiment to produce a machine whose motion shall be perpetual, the United States government are now spending a large sum of money in experimenting upon an invention which will be condemned in good time, as have been all its predecessors. To our mind a properly constructed saw mill comes as near to the solving of the problem as anything yet experimented upon. If a mill be built with saw-dust feeders to take the dust as it drops from the saw and deliver it on the grates, it is evident to our mind that so long as the logs are supplied to the saw the perpetuity of motion can be maintained. The engineer having once let on steam to the engine, need have no care other than to see there is a minimum loss or damage from wear and tear, and the whole thing runs. Automatic devices enable the pumps to maintain a proper supply of water in the boilers. The boiler feeders supply the fuel, and the acme of results is attained, for while we have not (and will we ever) get rid of the resultant waste by friction and wear of parts, we have got the power, and by the simple act of providing it with logs to furnish saw-dust, by automatic or self feeding process for combustion, which after all is the measure of value of the power, be it perpetual or otherwise. When we get the thing down to an automatic hauling of logs into the mill, automatic placing of them on the saw carriage and setting, and automatic running out sorting and piling of lumber, why want we have the whole thing? "When I catch this fish and one more, I'll have two."

In our issue of the 29th ult. we stated that the furnace of the Topton Iron Co. will soon be blown out. We should have said it will soon be blown in. The furnace has been out of blast since February, and the company have made preparations to resume work during the latter part of the present month.

The stack of No. 2 furnace, at the Himrod Works, has been taken down, and a larger stack is being erected in its place by John Hennessy, of the Cleveland Boiler Works, who has the contract. The furnace has a jacket 23 feet 4 inches in diameter. The stack will be 70 feet high.



Tempered Steel Spiral Springs,

Of all sizes and descriptions, made to order by

JOHN CHATILLON &amp; SONS, 91 &amp; 93 Cliff St. N. Y.

Our Springs are used by the U. S. Government, and various Military, naval and other Scientific Institutions.

## THE CANADIAN BANK OF COMMERCE.

Capital - - \$6,000,000, Gold.

Surplus - - \$1,800,000, Gold.

The New York Agency, 50 Wall St.,

Boys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

J. G. HARPER, Agents.

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**GEORGE GUEUTAL & SON,**

39 West 4th St., New York.

IMPORTER OF



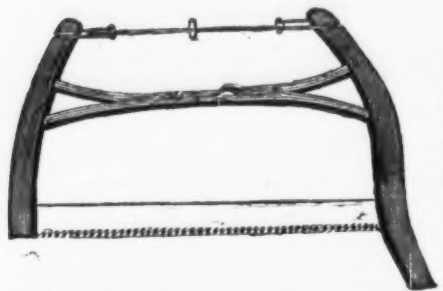
Wood Screws, Steel in Sheets,  
BAND SAWS, TOOLS FOR BRAZING, &c.  
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

**H. W. PEACE,**

MANUFACTURER OF

**Saws of all kinds.**

FACTORY, WILLIAMSBURG, N. Y.

**Elliptic Forked Saw Frame.**

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

**HARVEY W. PEACE,**  
Sole Proprietor & Manufacturer,  
**VULCAN SAW WORKS.**  
WILLIAMSBURG, N. Y.

**AMERICAN SAW CO.,**

Manufacturers of

Movable Toothed Circular Saws,  
**PERFORATED CROSS-CUT SAWS**  
And SOLID SAWS of all kinds. Trenton, N. J.

**THE SILVER STEEL  
DIAMOND CROSS-CUT SAW.**

\$1.50 Per Foot. Patent Secured



THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the **SOLE MANUFACTURERS FOR THE UNITED STATES.** So confident are we that this is the best Cross-cut Saw in the market that we **CHALLENGE THE WORLD.** Orders promptly filled.  
**E. C. ATKINS. H. KNIPFENBERG.** Saw Manufacturers and Repairers, Indianapolis, Ind.

**Lloyd, Supplee & Walton,  
HARDWARE FACTORS.**

MANUFACTURERS OF

**Bonney's Hollow  
AUGERS.**

Stearn's Hollow Augers  
and Saw Vises

Bonney's Spoke Trimmers

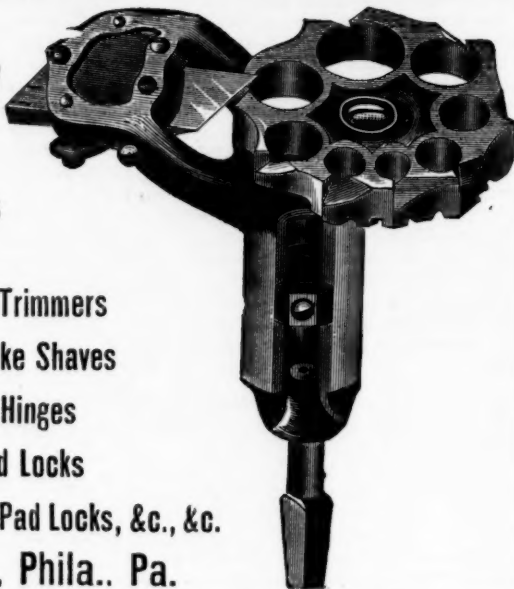
Double Edge Swoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &amp;c., &amp;c.

625 Market St., Phila. Pa.

**Bemis & Call Hardware & Tool Co.'s  
PATENT COMBINATION WRENCH.**

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a Combination which has no equal. For Circulars and Price List, address,

**BEMIS & CALL HARDWARE & TOOL CO. Springfield Mass.****Yale Locks**

Ornamental Real Bronze Hardware.  
**YALE LOCK MFG. CO., Stamford, Conn.**  
Salesroom, No. 298 Broadway, New York.

**E. M. Boynton,**80 Beekman Street,  
**NEW YORK,**

Manufacturer of

**Saws of all kinds.  
LIGHTNING SAWS.**

Two Direct Cutting Edges, instead of one Scraping point.



Note extra steel and durability over the old V, out-lined on M tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

To HENRY DISTON &amp; SONS:

Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.  
Henry Diston & Sons cannot furnish Lightning Saws. Why do they imitate mine?

**J. FLINT,**

Manufacturer of

**ALL KINDS OF  
SAWS**

And Plastering Trowels,

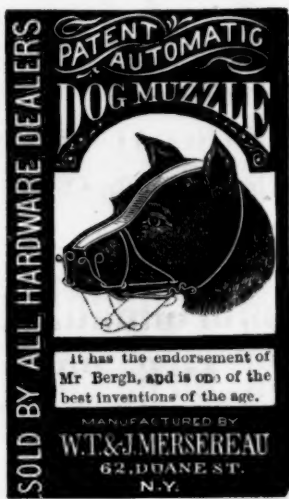
ROCHESTER, N. Y.

A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. **Dietrich's Double Hand One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

**Rogers' Self-Sharpening  
HOE.**

The best Hoe in market. It will not batter or break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the "Boles Hoe" or any Hoe in market.

For Sale at Manufacturers' Prices by  
**RUSSELL & ERWIN MFG. CO.,** - New York.  
**BYRNE & FITZSIMONS,** - Albany, N. Y.  
**KENNEDY, SPAULDING & CO.,** - Syracuse, N. Y.

**Clement & Hawkes Mfg. Co.**

Manufacturers of

**SHOVELS,**  
Planters' Hoes, Trowels and Machinery.  
**Northampton, Mass.**  
Send for Circular and Price List.

**The Hartford Foundry & Machine Co**

Successors to the

**Woodruff & Beach Iron Works,**  
**HARTFORD, CONN.**  
**J. S. Hunter, Pres. E. J. Murphy, Treas. & Sec.**  
High and Low Pressure Marine & Stationary

**STEAM ENGINES AND BOILERS,**  
Mining, Powder & Paper Mill Machinery,  
And every variety of Iron and Composition Castings made to order.

The following are a portion of the Engines manufactured at these works, and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis Mo. and Hartford, Conn.; and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloop of War Michigan, Kearsage, Manitou, Minnesota and Piscatawa and the gun boats Cayuga, Pequod and Nepesic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

**WHEELER, MADDEN  
&  
CLEMSON,**

Manufacturers of Warranted Cast Steel

**SAWS**of every description,  
including

Circular, Shingle, Cross Cut,  
Mill, Hand, Roberts' and  
other Wood Saws,

&amp;c., &amp;c

**Cast Steel Files**

of the well known brand of

**Wheeler, Madden & Clemson.**

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.



make a specialty of the **LARGEST SIZES** of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence: **Evenness of Temper.**—The peculiar structure of my furnace subjects all parts of the saw to a **HEAD** heat, and when dipped in the oil bath secures perfect uniformity.

**Perfect Accuracy in Thickness.**—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed **BALANCES PERFECTLY**, which is proof positive of the right accomplishment of the work.

**Properly Hammered.**—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time **RUN TRUE**. This department is under the personal supervision of myself, who has devoted over **twenty years** to the art of saw making.

I am sole proprietor and manufacturer of the celebrated "**Challenge**" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

**JAMES OHLEN.****V. G. HUNDLEY, Agent,**

79 Reade St., N. Y.

**NORTH CAROLINA HANDLE CO.,**

(Wilson &amp; Shober, Props.)

Manufacturers of

**AXE, PICK, GERMAN & AMERICAN****SLEDGE, and other Handles.**

Full assortment always on hand.

**W. R. OSTRANDER,**

Manufacturer of THE BEST

**ALARM WHISTLES,****SPEAKING TUBE, ELBOWS, ETC**

Fitting up Speaking Tubes a specialty.

19 Ann Street, NEW YORK

**J. CLARK WILSON & CO.,**

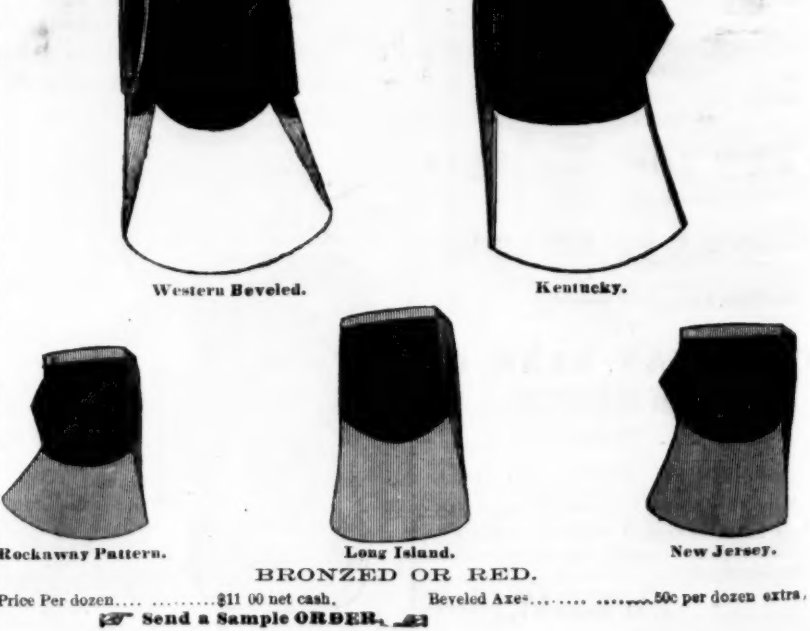
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81 Beekman St., New York.

The Axe for the Season of 1875 and '76.

**H. CLARK'S CAST STEEL AXES.**

Every Axe fully Warranted.



Price Per dozen.....\$11 00 net cash. Beveled Axes.....50c per dozen extra.  
Send a Sample ORDER.

**VAN WART, SON & CO.**

Hardware Commission Merchants,

**BIRMINGHAM, - ENGLAND,**

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184 &amp; 186 Duane Street, N. Y.

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At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for **John Himmer & Son's Celebrated Harness and other Needles.**

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**OSCAR IRVING VAN WART & Co.,**

FORWARDING AGENTS.

2 South John Street, LIVERPOOL.

**LE COUNT'S****Pat. Machinists' Tools.**

REDUCED PRICES.

Set Iron Dogs,  $\frac{3}{4}$  to 2 in.....\$ 5.00  
" " "  $\frac{3}{4}$  to 4 in.....12.00  
" Steel "  $\frac{3}{4}$  to 2 in.....6.00  
" " "  $\frac{3}{4}$  to 4 in.....13.00

**Iron and Steel Clamps, Die****Dogs, Clamp Dogs,****Vise Clamps, Expanding Mandrels, &c.**

Send for latest Price Lists to

**C. W. LE COUNT,**

South Norwalk, Conn.

**JOHN MAXHEIMER,**

Patented,

June 3, 1862; April 6, 1869;  
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1874; Dec. 22, 1874.

Manufacturer of

- FULL SIZE OF -

WIRE CONNECTION

**JAPANNED and****PATENT EUREKA**

Bright Metal

**BIRD CAGES.**Nos. 247 & 249 Pearl Street  
**NEW YORK.****H. CARTER,**

290 PEARL ST. NEW YORK.



Manufacturers of and Dealers in all descriptions of

Moulders and Plasterers' Tools, and Dealers in

General Hardware, Glided Copper Weather Vanes.

CARTER'S PATENT CARRIAGE LIFTING JACK, &amp;c.

Moulders' and Plasterers' Tools.



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## John Russell Cutlery Co.,

FACTORIES AND OFFICE,  
TURNERS FALLS, MASS.

Manufacturers of

# TABLE CUTLERY, Butcher, Painters' and Druggists' Knives

IN GREAT VARIETY

Extra Hard Rubber Handle Table Cutlery of our own Manufacture.  
Fine Ivoride Handle Table Cutlery, very White and Durable.  
Sample Office, 77 Chambers St., N. Y.

## NORTHAMPTON CUTLERY CO.,

Manufacturers of all kinds

## American Table Cutlery,

Cook, Butcher, Shoe and Hunting Knives. Sole Agents for Rogers' Cutlery Co.  
Plated Forks and Spoons. THEODORE WEED, Manager, 45 Murray Street, N. Y.

## FRIEDMANN &amp; LAUTERJUNG,

MANUFACTURERS OF

Pen and Pocket Cutlery, Solid Steel Scissors, F. & L. Shears, Razors,  
Russia Leather Straps, Oil and Water Hones, &c.

Sole Proprietors of the renowned full concave patent

## "ELECTRIC RAZORS."

Also Agents for the BENCALL RAZORS.

American Table Cutlery, Butcher Knives, &c.  
14 Warren Street, NEW YORK. 423 N. Fifth Street, ST. LOUIS, MO.

TABLE KNIVES AND FORKS OF ALL KINDS,  
AND EXCLUSIVE MAKERS OF

And the "Patent Ivory" or Celluloid Knife. These Handles never get loose, are not affected by hot water, and are the most durable knives known. Always call for the Trade Mark "MERIDEN CUTLERY COMPANY" on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

## THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of

## PATENT FINE PEN &amp; POCKET CUTLERY

WEST MERIDEN, CONN.

The only Knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make

## NICKEL &amp; SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by Messrs. J. Clark Wilson & Co., No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by Messrs. G. B. Walbridge & Co., No. 99 Chambers Street.

## Naugatuck Cutlery Co.,

Manufacturers of FINE

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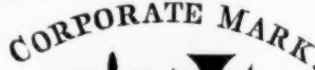
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## PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Aug. 2, 1875.

I had scarcely closed my correspondence of last week, when everything promised peace, plenty and prosperity, when the news of the Duncan-Sherman failure set our people into an incipient panic, and for a time greatly disturbed both confidence and values. A few hours sufficed, however, to show the improbability of this failure making another Jay Cooke panic, and business resumed its course.

The features of the week have been Mr. President Gowen's argument before the Railway Investigating Committee of the Reading Railroad matter, of which more anon; and the meeting of creditors of some three defunct iron firms, one of which belongs to each of the three cities, New York, Philadelphia and Pittsburgh. The insolvency here referred to includes the firms of Gerry, Tilton & Colwell, of New York; the Girard Tube and Iron Works, of this city; and Pittsburgh Bolt Works, and the meeting of creditors was held at the Commercial Exchange, in the afternoon of the 30th ult. The somewhat complicated history of the affairs of the firms shows a sort of "tripartite agreement" to have been entered into between them. It appears, as alleged, that the firm of Gerry, Tilton & Colwell, iron brokers in New York, and the Pittsburgh Bolt Works, indorsed mutually for each other to a very large extent, and during the present spring purchased a large interest in the Girard Tube Works, of this city. The three firms were represented by counsel, and the creditors represented, among others, were the Delaware Rolling Mills, Hughes & Patterson, Philadelphia; Iron City National Bank; the Old Dominion Iron and Nail Works, Richmond; New Jersey Steel and Iron Company; Pennsylvania Galvanizing Works; American Iron Bank; Masonic Iron Bank, Pittsburgh; Philadelphia and Reading Railroad Company; First National Bank, Pittsburgh; Merchants and Manufacturers Bank; Cambria Iron Co.; W. C. Allison & Son; Seyfert, McManus & Co.; Hunter, Tiller & Co.; J. B. Allen & Son; F. Newkumet; Reed, Stickney & Co.; T. C. Henry; W. F. Potts Son & Co.; Chas. Armstrong & Co.; Lewis, Oliver & Phillips; Proctor & Gamble; Reese, Graff & Woods, &c., showing a number of well known iron firms. The affairs had been so managed that the chairman stated that any compromise with one firm would require one with all three. The liabilities, including indorsements, were as follows: Girard Tube Works, \$289,528.25; Gerry, Tilton & Colwell, \$509,160.27; Pittsburgh Bolt Works, \$492,094.69, or a total of \$1,291,383.21. Without indorsements: Girard Tube Works, \$224,956.25; Gerry, Tilton & Colwell, \$25,714.12; Pittsburgh Bolt Works, \$309,467.72, or a total of \$560,140.09. Assets were: Girard Tube Works, \$40,331; Gerry, Tilton & Colwell, \$58,321.27; Pittsburgh Bolt Works, \$100,389.47, or total assets of only \$199,042.74. Beside this bill payable of the Girard Tube were, \$225,251.50, of which \$57,200 were secured by iron and pipe hypothecated, and worth \$44,704.61. Their liabilities, as endorser, are \$64,570, and their property is mortgaged by four mortgages to \$103,363.07. Their assets consist of \$40,331, good accounts and stock, with \$31,255.83 of doubtful accounts. The Pittsburgh Bolt Co. shows \$380,462.51 in bills payable; \$30,000 in accounts due; \$7500 unpaid wages; and \$184,224.97 as endorser for their liabilities. They have bills receivable and bonds unrealizable, \$98,621, and \$4,373.62 account of Chicago and Iowa R. R. Co., attached by A. B. Miller & Co. as bad assets and stock, \$55,544.66; cash, \$1,701.98; bills receivable, \$2,629.77 as good assets. They have issued bonds on mortgage for \$200,000, of which \$63,300 were sold, and \$136,800 hypothecated with \$45,000 in bonds of Allegheny Valley R. R. Co. as collateral. Gerry, Tilton & Colwell show liabilities of \$308,605.32, of which \$22,891.20 is secured by pig iron. Assets are \$58,321.27 good, and \$86,908.08 bad; \$993.41, doubtful; \$1000, borrowed pig iron; \$15,000 of Girard Tube Works notes with their indorsement, held by Riverside L on Works as collateral for Pittsburgh Bolt paper; \$9,752.50 in repaid bills of lading, in their hands, of Chess, Smythe & Co., Pittsburgh; \$819.75, account of Edward Samuel & Co., Phila., attached by Reed, Stickney & Co.; \$138,400, Tube Works stock; \$57,600, Pittsburgh Bolt stock; \$5500, Cincinnati and Terre Haute R. R. Co.'s bonds; also \$54,000, Girard Tube 3d and 4th mortgages. From this intricate summary the counsel deduced that the Girard Tube Co. could pay 14 cents on the dollar; Gerry, Tilton & Colwell, 11 cents; and Pittsburgh Bolt, 16 cents; and proposed for the Tube Company and Gerry, Tilton & Colwell to pay in 30 days, 25 per cent. on their paper with one name, 35 per cent. on same with two names and 45 per cent. on same with three names, and to buy Pittsburgh Bolt claims at same rate. To do which creditors of G. T. & C. and Pittsburgh Bolt Works, must assign their claims to Girard Tube Co. The Pittsburgh Bolt Works claim \$100,000 good assets and their mill, costing \$450,000, and stated that with one, two and three years extension they would work through. A committee of three, to examine affairs and report as to accepting proposition, was appointed, consisting of J. B. Seully, Pittsburgh, T. C. Henry, Philadelphia, and James E. Graves, New York to meet on Aug. 6, inst. The complicated state of affairs is regarded unfavorably by creditors, and has made much talk. Mr. Graves resigning, Mr. Edward Cooper, of New York, was appointed to fill his place. I have been thus particular in detailing the figures of indebtedness, assets, etc., for the benefit of the creditors of the parties, who are very numerous, and all or nearly all, included among the readers of *The Iron Age*.

The argument of Mr. Gowen before the Legislative Committee was a very able effort, and will be published in full. It gives a great deal of information as to capital and labor troubles, and will be the cause of further legislative action. Among other statements, the following figures show the magnitude of the operations of a great corporation; thus, the company employs 22,546 men, or more than the army of the United States, and pays them \$988,659—nearly a million dollars—a month for wages. It has bought in material from Philadelphia and local manufacturers, in the last five years, \$24,000,000, and has paid in taxes to the State, in five years, irrespective of United States and local taxation, nearly \$3,000,000.

Last week I noticed the increasing commerce of our city, and as an evidence of it I here add that, notwithstanding the regular steamers to Liverpool and Antwerp, the freight offerings are such as to demand the chartering of an extra steamer weekly on private account. The steamer Vanguard is the first of these, and is now about to load with an assorted cargo for Liverpool. The Commercial Exchange during the week adopted a series of complimentary resolutions to Messrs. H. L. Gregg & Co., which firm has just established the new line of clipper ships to San Francisco.

The new railroad to your city via North Penn,

Yardville, Bound Brook, &c., is progressing rapidly. The grading is nearly done; the piers of the Delaware River bridge are being built, and the iron work in the shops of the Coffrode Bridge Company. The road will be completed and opened next spring.

The railroad companies are making vigorous preparations for Centennial travel next summer. The Pennsylvania Company's arrangement of tracks, depots, &c., at the grounds will be very ample and are now fully announced. These include a depot 650 by 100 feet, without tracks, but simply for passengers, opposite which will be a very large hotel. The tracks will be in a new yard adjoining the Exhibition grounds, and will be laid in a circle, 1000 feet in diameter, flattened on one side. These tracks will be used for trains from all points, switching on to different points of the circle. Trains will discharge and proceed around the circle to the rear of the depot, where some fourteen large sidings will be arranged. Platforms for passengers, covered from the weather, and with passages to trains leaving North, South and West, will be arranged. There will be over seven miles of tracks in this yard which will connect with the freight tracks through the Centennial buildings. Preparation is to be made to carry 5000 passengers daily each way on the New York division alone. The Reading Company will also erect a large and handsome depot near Memorial Hall, which will remain permanently, and be used for the numerous park excursions they bring from their line of road. It will be 50 by 128 feet, with wings 40 by 80 feet, and a height to eave of 110 feet, and will combine restaurant, waiting rooms, &c., and be very ornamental. Platforms 500 feet will extend along their tracks outside. Other railroad companies are building sidings on which to run excursion trains with cars provided with locked closets in place of the usual overhead rack, each closet having a key corresponding to number of seat and ticket, and which unlocks no other. Excursionists of a day from points nearby can thus bring and keep their traps, lunch, &c., and use the cars as a hotel during their visit to the Exhibition. But it wants more, more money and more exhibitors, and must have both.

## Iron Trade Matters in the Lebanon Valley and Vicinity.

A valued correspondent, writing from Lebanon, Pa., sends us the following gossip in regard to iron matters in that vicinity:

Business prospects seem improving. Weimer & Birkenbine have now two large vertical blowing engines to build, each with 7 feet blowing cylinders and 7 feet stroke; two horizontal blowing engines to rebuild, and considerable repair work, such as new hot blast pipes and mains, tuyere fixtures, etc. Prices are very low, and the remuneration but meagre.

Hon. E. D. Coleman has blown out the last of his three furnaces, and is repairing them. The Donaghmore Furnace was blown in lately after being out about three months. Metly's "Lebanon Valley" Furnace is in blast and doing well. During the night turn the slag of this furnace is granulated for railroad ballast, and during the day turn it is converted into paving blocks; the melted slag being run into molds and slowly cooled. The Berd, Coleman and North Cornwall furnaces are stocking up with ore and stone, and will probably blow in as soon as dependence can be placed on coal. The two anthracite and charcoal furnaces at the Cornwall ore hills are in blast; the latter is 140 years old. The above are all in Lebanon or in the immediate vicinity.

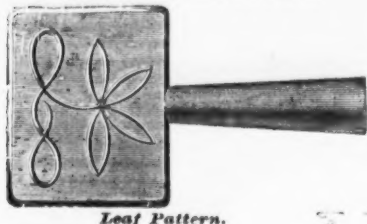
The new furnace at Sheridan is working splendidly, and the old furnace is ready to blow in at the slightest encouragement. The new Robertson Furnace is again in blast, and I have heard no unfavorable reports. The Mount Hope Charcoal Furnace, in Lebanon county, nearly 100 years old, which has been out of blast most of the time for ten years past, has blown in, owing to the estate being in court on suit of partition, but its present owner, A. Batca Grubb, son of the founder of the furnace site, is now having plans perfected by Weimar & Birkenbine for adding blowing engine and hot blast. The furnace is at present driven by water-power. At Reading the only furnaces in blast are one of the Keystone Iron Co.'s plant and one of Seyfert & McManus. Eckert & Bro. are repairing their two stacks. Temple Iron Company are rebuilding all that were destroyed by fire, and putting in a new engine and hoist. Leesport Iron Company is also repairing thoroughly. Out of 34 furnaces in what might be termed the Reading district I know of but 13 stacks which are in blast.

The Morgan Furnace.—The Portage Lake (Mich.) Mining Journal says: "The Morgan Furnace, formerly controlled by the Morgan Iron Company, but now running under a lease of C. Donkersley, is one of the most complete furnaces on Lake Superior. It was blown out on the 4th of July for repairs, after having been in blast fourteen months, during which time it turned out 9300 tons of pig iron—as large a product, in proportion, as any other furnace in this district. A new hearth is being built, beside many other minor repairs. The hot blast is also being overhauled. William Boles, a thorough mechanic in this branch of furnace building, has charge of the work, and his employer has every confidence in his skill and ability. The furnace has a 6 foot bosh and a 15 foot stack. The charge is put in by a bell and hopper apparatus, one of D. H. Merritt's manufacture. The power used is steam with 16x30 cylinder. The boilers supply steam for the pumps, also for the crusher. The boilers are undergoing some slight repairs—in fact, the whole furnace is being thoroughly overhauled from top to bottom. There are about fifty kilns supplying the furnace with coal. They have a tram railroad running from the furnace ten miles north to Dead River. Along the line of this road kilns are stationed at different intervals, and the charcoal is taken away daily. The tram road runs to the top of the hill back of the furnace, so that no hoisting is needed to get the coal or ore to the mouth of the stack. The furnace is supplied with flux or limestone from its own quarry, situated about one-third of a mile away. Two tracks run to the furnace, one to the top and one to the bottom. The top track brings in the iron ore and the lower track takes away the pig iron as it is manufactured. The casting house is a first-class one, very extensive, and is well situated.



# H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



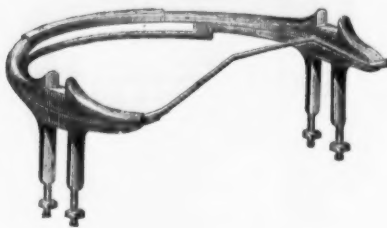
Leaf Pattern.

King Bolt Yokes.

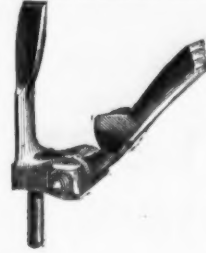


Established 1850.

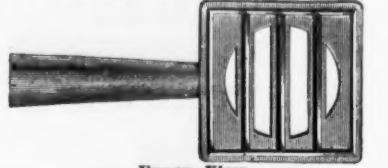
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.

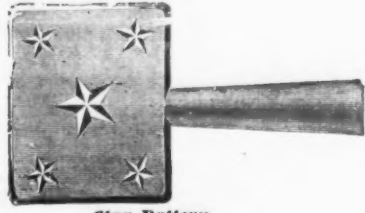
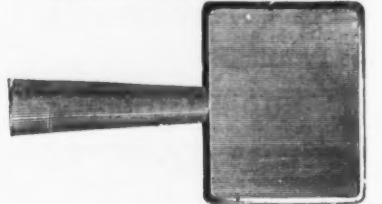


Upper View.



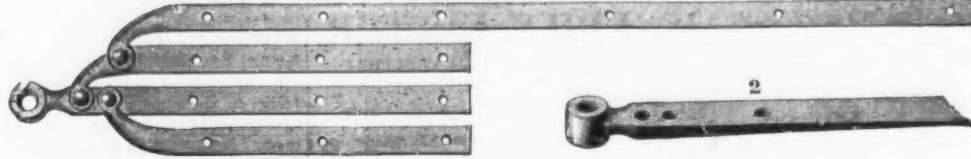
Lower View.

Solid Plain Pattern Steps.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.



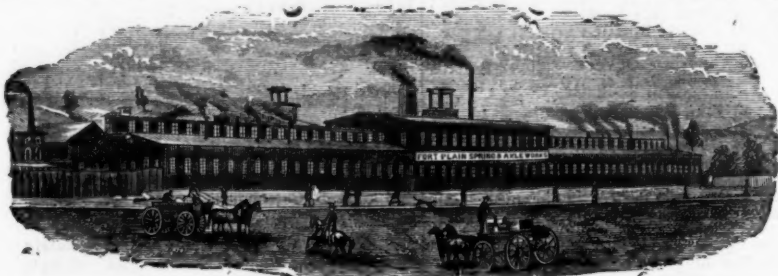
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Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.



MANUFACTURERS OF

English and Swedes Steel Springs, and Iron and Steel Axles.

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Black, Bright, Tempered and Oil Tempered Springs,

Of any Pattern or Style. Also for AXLES of any description, from a COMMON LOOSE

COLLAR to the FINEST OF STEEL.

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved Machinery, we defy competition.

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### CARRIAGE BOLTS.

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Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not turn in its place.

MANUFACTURED BY

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Carriage and Tire Bolts,

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All Styles of

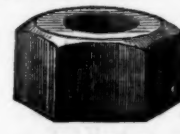
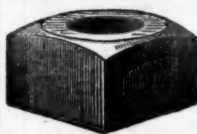
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Blank Bolts, Skein Bolts, Square Head

Bolts, Plow Bolts, &amp;c., &amp;c., &amp;c.

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Ice House Hinges & Fastenings.

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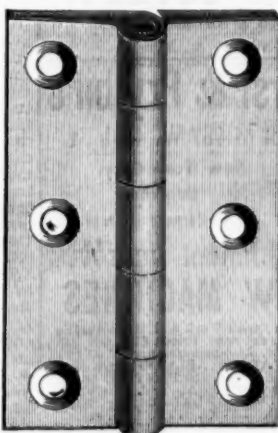
W. &amp; J. TIEBOUT,

Manufacturers of

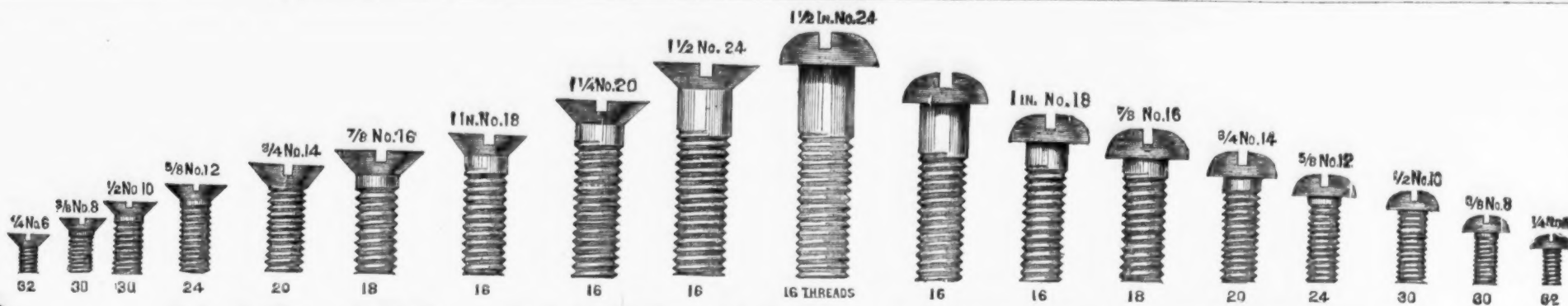
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OF SIZES, Nos. - - 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, SCREW GAUGE.  
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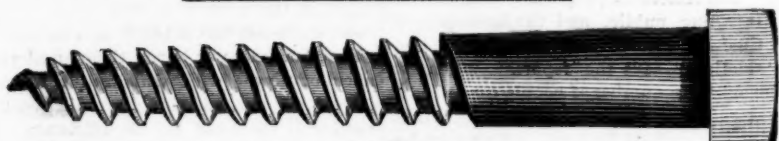
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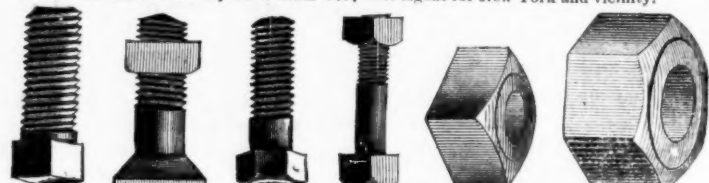
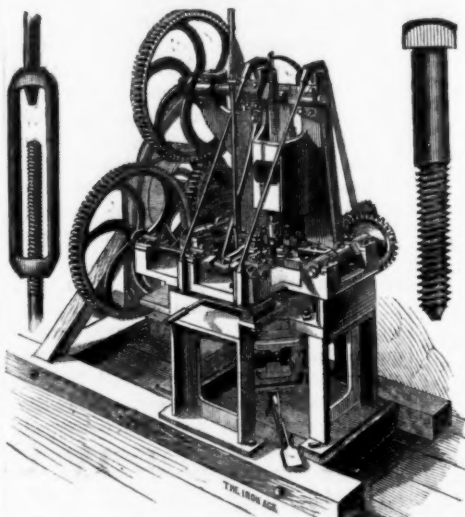
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# The Iron Age.

New York, Thursday, August 5, 1875.

DAVID WILLIAMS - Publisher and Proprietor.  
JAMES C. BAYLES - Editor.  
JOHN S. KING - Business Manager.

New York, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents. On the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

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## Ferro-Manganese.

The increase in the uses and production of Bessemer and Siemens-Martin steel during the past ten years, has created a corresponding demand for every element which enters into the constitution of this metal or is used in its production. It has been frequently shown that the supply of iron ores suitable for the production of pig metal adapted for conversion into steel is very abundant in the United States, and that new discoveries of ores of this class are frequently made. The use of spiegel-eisen is, however, imperative in the Bessemer and Martin processes alike, for well known reasons, and, unless supplemented by a better alloy of manganese, must continue to extend with the growth of the steel works. For our supply of spiegel-eisen we

are, to a great extent, dependent upon the European market, and at prices which materially increase the cost of the steel, while they are generally subject to the fluctuations incident to any product which can be cornered or controlled by capital.

Whether manganiferous ores, suitable for the production of spiegel-eisen, are to be had in the United States in sufficient quantity to supply the demand for this metal is not definitely known, but it is certain that the manufacture is only conducted in two or three localities at most, the quality said to be inferior to the foreign article, and the production but a very small proportion of the amount used, which, on completion of the Bessemer steel works now in progress of construction, will amount to fully 50,000 tons annually, without taking into account the consumption in the open hearth process. The price of spiegel-eisen has ruled lower for the current year than at any previous time, but it is now worth from \$40 to \$41, gold, or, at present rate of premium, \$45 to \$50, currency, exclusive of duty, charges, &c. Spiegel-eisen is an alloy of iron, manganese and carbon, with greater or less freedom from other impurities, in proportion of 10 to 12 per cent. manganese to 4 1/2 or 5 per cent. of carbon. Of late years it has been found in practice that the use of an alloy of iron and manganese containing a higher percentage of manganese, and produced by a different process from that employed in making spiegel, insures better results in both the Bessemer and Siemens-Martin processes, since it allows of the use of inferior grades of pig metal, or of metal containing more phosphorus within certain limits, while the proportion of the alloy used is less than that of spiegel-eisen required. This alloy is known as ferro-manganese, and, as at present produced, is generally a much simpler combination of iron and manganese than spiegel. The first use of ferro-manganese, or an approximation to it, in the improvement of steel, is probably due to Josiah Marshall Heath, of Sheffield, who, in 1836, patented the employment of what he termed "carburet of manganese," or metallic manganese, in the production of crucible cast steel. The addition of 1/2 to 1 per cent. of this metal rendered the inferior coke irons of England available for making cast steel. The advantages resulting were the removal of red-shortness from the iron, and imparting the resulting steel properties of welding and working. But the inventor of this process, which greatly advanced the steel industry of Sheffield, destroyed his patent, commercially, by recommending the use of oxide of manganese mixed with coal tar, or other carbonaceous substance, in the steel, which, while cheaper, was in effect the same thing, since before the steel was melted the carbon present reduced the oxide of manganese to the metallic state, and formed the carburet of manganese in the crucible. But in the Bessemer and Siemens-Martin steels the use of manganese in this way is not convenient, practicable nor economical. A given proportion of carbon is required to recarbonize the product which has been decarbonized by the blast, and an ascertained proportion of manganese to overcome any oxidation or red-shortness resulting from too long continuance of the blast, or from impurities in the metal.

The first practical production of manganese alloys for use in the Bessemer process, and the origin of ferro-manganese, strictly so called, was by Henderson, of Glasgow, in 1859 or 1860. Henderson's mode of manufacture, as patented, consisted in the admixture of carbonate of manganese, a by product of soda works in the manufacture of bleaching powder, with an equal quantity of pure calcined iron ore, which was a refuse from copper works treating an iron and copper pyrites from Spain. The extraction of the sulphur and copper from this ore left an oxide of iron, which, when purified, was in a condition very suitable for reduction, and which mixed with the carbonate of manganese and charcoal powder, and melted in crucibles in a Siemens furnace, produced the ferro-manganese. Later, Prieger, a Prussian metallurgist, produced ferro-manganese by melting admixtures of oxide of manganese, charcoal and finely divided scrap iron in crucibles of from 30 to 50 lbs. weight, submitted to a white heat, and in this way succeeded in making an alloy containing from 66 to 80 per cent. manganese. The industry under one or both of these patents has been considerably extended on the Continent, notably by the Terre-Noire Company, of France, and in Styria by various works which produce an alloy running from 20 to 80 per cent. manganese, and 5 per cent. carbon, which has been and is greatly sought by both Bessemer and Siemens-Martin steel makers abroad, but rules as yet at very high prices. At two works in the United States, both Siemens-Martin steel works, ferro-manganese is made, and the product has been

employed to some extent by our Bessemer works. The following analyses of a fair type of spiegel, and low and medium grades of ferro-manganese, are given for comparison:

SPIEGEL.	FERRO-MANGANESE.
Carbon.....	No. 1. No. 2.
Silicon.....	5.08 5.061
Manganese.....	0.214 0.673
Calcium.....	23.412 37.886
Magnesia.....	0.073 0.340
Phosphorus.....	0.075 0.085
Sulphur.....	0.017 0.172
Copper.....	0.008 0.034
Arsenic.....	none none
Iron.....	84.025 70.565

These grades of ferro-manganese are very high priced, and increase very rapidly in value with an advance in the percentage of manganese, as witness the following prices of Styrian ferro-manganese: 20 per cent. manganese, \$62, gold; 26 per cent., \$79; 30 per cent., \$90.50; 36 per cent., \$113.25; while the higher grades of French ferro-manganese rule, for 45 per cent., \$230; 50 per cent., \$250; 60 per cent., \$260, etc. Granting that the employment of ferro-manganese enables the use of cheaper irons to produce a steel of given quality, which is well established, the commercial aspect of the case demands the production of this article in this country, and at prices which shall place it within the reach of consumers. Manganese oxide, in various forms, is found in great abundance, and free from great impurities, throughout our country. Either pure iron oxides or pure irons may be better obtained here than abroad. No obstacle, therefore, remains, beside that of the cost of the patented processes referred to, and if these be obstacles, they are easily avoided. The difficulty in producing ferro-manganese, it may be broadly said, lies in preventing the loss of the manganese in the slag formed in producing the alloy on a large scale, but an alloy capable of containing any desired percentage of manganese may be made by the production of metallic manganese, or cast manganese, as it is called, which may be readily melted with iron and carbon, or iron containing carbon, and give the desired grade of ferro-manganese. Nor is the production of cast manganese expensive or seriously difficult. This metal, as originally prepared, is not pure manganese, but is to manganese what cast iron is to iron. It is prepared with common materials, and, with a given ore, the cast manganese is purer than the metal extracted by any other process. It is obtained with facility, security, and at less expense than in other methods, and, what is most important, in view of the high price of ferro-manganese and the prospective demand for it, may be prepared in unlimited quantities. The details of this process cannot be given in full in an article of this character, but may be stated in general terms to consist of the reduction of manganese ores in presence of a flux, which will readily suggest itself to practical metallurgists. There are other points of detail, such as the preparation of the vessels or crucibles in which the manganese ore is reduced, the exclusion of the very oxidizable metal from contact with the air, and, in cases where an extremely fine alloy is needed, the refining of the cast manganese by simple means. All of these points are, however, readily understood by the metallurgist in practice, and the product gives a metal which can be used to produce an alloy of iron, carbon and manganese, containing precisely the elements required and no others, and at a cost which would necessarily be far below that of ferro-manganese as at present made. The properties of the cast manganese and its constituents may be inferred from the following analyses of average samples of ore, and the metal both cast and refined. The ore first used for this purpose presented the following composition:

Peroxide of manganese.....	79.50
Peroxide of iron.....	6.50
Water.....	3.50
Phosphate of lime.....	traces
Gangue.....	10.50
Containing 50.5 per cent. metallic manganese.	100.00

The cast manganese obtained from this ore gave as follows:

Manganese.....	96.90
Iron.....	1.05
Aluminum.....	0.10
Calcium.....	0.05
Phosphorus.....	0.05
Sulphur.....	0.05
Silicium.....	0.85
Carbon.....	0.95
	100.00

This cast manganese, when refined, presented the following composition:

Manganese.....	99.910
Iron.....	0.050
Silicium.....	0.015
Carbon.....	0.025
Other substances.....	traces
	100.000

It is evident that, whether refined or not, we have here a product from manganese oxide reduced in a simple manner, which furnishes the desired material for admixture with iron to form ferro-manganese, or which, by the addition of more carbon, may form a carburet of manganese carrying any desired proportion of that metal with a given proportion of carbon, and without the iron base, should such a

product be required. The object aimed at, and which can be attained by this process, is a means of producing ferro-manganese at a cost which will allow of its general use in the manufacture of Bessemer and open hearth steel, while its use would also be valuable in improving inferior pig irons. The margin between the present prices of ferro-manganese and the cost at which this metal could be produced, would seem to justify the investment of large amounts of capital in its manufacture, while it would at once create an important industry and relieve the steel works of a tax upon them now paid to foreign manufacturers almost exclusively.

On another page we publish an interesting correspondence between Mr. J. Blodgett Britton, of Philadelphia, Mr. J. L. Barbour, and Governor Kemper, of Virginia, relative to the establishment of a Virginia Bureau of Ores. The plan proposed by Mr. Britton is practicable, it will accomplish good results without much expense to the State, and we are glad to see that it meets the approval of the Governor and influential citizens.

With regard to the exhibition of ores at the Centennial, we have but little to communicate. A few States will probably exhibit specimens of ores and coal, but at this time we see no encouragement to believe that we shall be able to make a showing that will in any respect represent the extent or variety of the mineral resources of the country. The only plan by which such a collection could have been made failed at the outset, because the iron masters would not contribute the money they had promised by vote of the Iron and Steel Association, and if anything is to be done it must be undertaken by the States, in one or two of which the importance of a proper representation at the Centennial seems to be fully appreciated. It is probable, however, that this portion of the exhibition will be a failure. No doubt there will be a good deal of tardy work done in a hurry, but the results are not likely to be of much value to anyone, except in the few cases in which the work has been undertaken by intelligent commissioners appointed to expend special State appropriations for this purpose.

## Ventilation of Railway Cars.

In the sixth annual report of the Massachusetts State Board of Health, there is a paper upon the subject of railway car ventilation. The object of the paper, it is stated, is merely to call the attention of the public to the unhealthy condition of the passenger cars upon our railroads, and to introduce some tests and experiments on the air of smoking and other cars, made by Prof. W. R. Nichols, of the Massachusetts Institute of Technology.

"The American people are eminently a 'traveling public,' and the aggregate of 'time spent in [railway cars]' is worth considering," says the report. When we consider the number of people carried each year, and the length of time during which they are confined in cars, the subject becomes one of much importance, but the full measure of this importance does not become manifest until we consider that human beings in passenger cars are crowded into much less space per individual than is considered safe or healthful under any other circumstances, and that, too, with very little ventilation.

The conditions are these: The average net air space of a passenger car is about 2500 feet, and the number of passengers from 60 to 75. In a smoking car there is about 50 passengers. The air space per individual varies from 33 1/2 to 50 cubic feet. In the most crowded of public buildings the amount of air space per individual is vastly greater than this. The British Royal Commissioners give 600 cubic feet as the proper space per man in barracks. They also recommend that 20 cubic feet of air per minute be given for each man; other authorities say that 10 feet will answer. Here is what ought to be. Now the state of the air in a passenger car can best be conceived when we say that the amount of carbonic acid in the air ought never to be greater than .0006, or six parts in ten thousand, and yet on a morning train into Boston the amount of carbonic acid found in the air amounted to nearly .0037 or 37-10,000, upward of six times the greatest amount that can be breathed with safety. It was no uncommon thing, when these experiments were made, to find the air of trains loaded with three, four and five times the quantity of carbonic acid that can be breathed with safety. Measuring the exhalations from the body by the amount of ammonia in the air, the results were remarkable. The outer air of Back Bay, Boston, was taken as the standard and the quantity of ammonia it contained called 100. In one of the Easton smoking cars it was found that the quantity of ammonia as compared with the air of Back Bay

was 575. On another train it was 310, and was reduced to 266 after stopping at a station. In other trains in which the air was tested the quantity found ranged from 175 to 400. These figures show from 1 1/2 to 5 1/2 times as great a quantity of animal exhalations as there should be. These experiments were made in November and December; of course, in the summer season trains are pretty well ventilated, because passengers generally are willing to allow ventilators to be open to the fullest extent. In times of showers, or on a cold day in summer, the state of a crowded car is frequently worse than in the winter time, because the exhalations and secretions from the skin are more copious. In the matter of ventilation and unhealthfulness the modern railway car is as bad as it can be, and is only equaled by the cabins of our ferry boats. It would be almost impossible to make either of them much worse and have people live in them for even a short length of time. The state of the atmosphere of cars is vastly worse than that of public buildings, and even of the waiting rooms of libraries and other places where the air is exceedingly impure.

Who is to blame for defective car ventilation? In considering this question we are met at the outset by the fact that the public does not care in the least whether a car has any ventilation or not. If the car is warm in winter and cool in summer, they are satisfied. Were adequate ventilators provided it is doubtful if the traveling public would use them. If a passenger dreams that fresh air is entering a car in the winter, he will not be satisfied until the opening is closed. In the summer time it is impossible to get any apparatus to work for the purpose of removing cinders, because passengers will raise the windows and so admit the cinders directly. With this feeling among their patrons, the railroads have little encouragement to try costly experiments in ventilating cars. The roads and officers of roads who have given special attention to this matter are met by a difficult problem, and also by utter indifference to their success on the part of the passengers. The problem itself is one of the most complex that has been propounded to engineers. The quantity of air to be supplied should in winter be about 10 cubic feet per minute per individual, which amounts to changing the whole atmosphere of the car in from 3 to 5 minutes. This, with the small contents of the car per individual, is difficult to do, because it must be done without creating draughts of any kind to annoy the passengers. In a car cold and heat can be endured, but a draught cannot be, and will be stopped by the passengers at any expense of trouble or safety. In this they are right, for the dangers from draughts of cold air are more imminent than those from the foul air, and they make themselves felt more quickly. Another mechanical difficulty is the motion of the train. With most engineers this is taken as a favorable circumstance, as it gives them an abundance of power with which to ventilate. No system of ventilation depending on the motion of the train for its efficiency will be of any value, because the speed is anywhere from 12 to 60 miles per hour, and the apparatus which at the slow speed would give the car all the air needed, would at the latter create a perfect hurricane. Trains must often wait motionless with passengers on them; at such times ventilation would be as defective as at present, if the motion of the train was to sustain the current. "Exhaust ventilators" in the roof can, under certain conditions, be made to work very well, but let the train stop or let a strong wind blow in the same direction as the train is moving, and they become useless. In winter the air should be warmed to a comfortable temperature, otherwise its introduction will be attended with discomfort to the passengers. In summer a much larger supply is needed than at any other season, because organic impurities are then much more abundant and more offensive, and a considerable amount of air is needed to dilute and carry them away. Probably it will be best to make heating and ventilation distinct matters, as the conditions are so various, but on this point each inventor has his own ideas.

In spite of the small encouragement which the public has given railroads in the matter of rendering cars more healthful, an immense deal of money and time has been expended in the attempt to give passengers fresh air. First among the plans that have been tried is that of having ventilators along the sides of the raised roof, or in the sides of the car just above the head of the passenger, in what is called technically the letter-board. These ventilators are of three kinds; those which allow the air to escape as it would from a chimney, because it is hotter than the external air; those which exhaust the air on the principle of a Giffard injector or ejector; and, lastly, those in which a pro-



jecting vane or hood of some sort deflects a current of air into the car. None of these are successful, except under peculiar circumstances. In cases where a natural draught is used, there is an escape of air from the car; the place occupied by the escaping air is occupied by cold air coming in from the outside through the same ventilators, and falling down on the heads of passengers. When a car is closed and these alone are in operation, their effects in clearing a car of smoke is a mere nothing. The exhaust and the injector ventilators are about as badly off, for when they are put on no opening is provided to allow the fresh air to enter and supply the exhaust in one case or for the foul air to escape in the other. It is certain that we cannot get a great volume of fresh air into a tightly closed room till we provide some means for the escape of the air already in it; nor can a great quantity of foul air be taken out till some opening is provided for the external air to enter at. Experiments have repeatedly shown the inefficiency of these plans; but they continue to be used because they are cheap, do no harm, and amuse a few passengers who have an idea that there should be something done for ventilation. We have known cars fitted up with ventilators which were complete in all respects save the important one of having an opening through them. It was a remarkable fact that passengers never complained of them. The next thing that is used, and one of the best, is to make an opening from the inside of the car over the end door, so as to allow a free entrance of air from beneath the hood or covering of the platform into the car; a like opening at the other end permits the escape of air. If kept open, these two openings will give a very fair and tolerably comfortable ventilation when a train is at a good speed.

Another plan which has given good results is to make an opening at each end of the car just over the end windows, closing the same by a wicket or swing window, the amount of spring being regulated by the angle at which the sash is placed. There is, of course, a strong draught, but it is in the faces of the passengers, and does not give as great inconvenience as it would in any other direction. In the last seats, however, the air is rather bad, as the foul air must all pass by them before it reaches the rear wicket. Doctor Allen, of Philadelphia; Mr. —, of Bath, Me.; and Mr. L. S. Starratt, of Athol, Mass., have all, with a considerable measure of success, elaborated plans by which warm pure air is taken into the car, and the foul air exhausted from the bottom. All these plans deserve success, as they give pure air in good quantity and without insurmountable difficulties. To devise a perfect system is by no means an easy thing. No one element of the problem is difficult, but there are so many requirements, and they are so various, that the task is by no means an easy one. The great point is for the public to wake to an appreciation of the importance of the matter, and, when the demand for better ventilation finds clear expression, the means of securing it will be found.

#### California as a Location for Iron Manufacture.

For several years past it has been proposed to establish the pig iron industry in California, but the plans hitherto proposed have thus far come to nothing. A correspondent of long practical experience in the building and management of blast furnaces, sends us the following estimate of the cost, running expenses and profit of a charcoal furnace with a capacity of 5000 tons per annum:

INVESTMENT.	
Cost of land 3000 to 5000 acres of the best timbered land in California.....	\$10,000
Cost of iron ore and limestone beds, independent of 25 cts. royalty on each ton of iron made from these ores and limestone.....	3,000
Cost of a furnace, water wheel, etc., similar to the one made at Leesburg, on the Atlantic & Pacific R. R., which made last year over 8000 tons.....	25,000
Cost of dwellings, kilns, wagons, horses, &c.....	22,000
Cost of all that is necessary for iron works to turn out annually 5000 tons.....	\$60,000
RUNNING EXPENSES AND PROFIT.	
Cost of ores—royalty on each ton of iron.....	\$0.25
Cost of mining and delivering two tons of iron ore, enough to make one ton of iron.....	2.75
Cost of mining and delivering limestone to make one ton of iron.....	.25
Cost of superheating and labor.....	3.75
Cost of 125 bushels of charcoal, at 8 cts. per bushel. Many furnaces use only 110 bushels.....	10.00
Cost of repairs on furnace, &c., yielding annually 5000 tons.....	1.00
Cost of one ton of iron, where ores, limestone, fuel and water power are so near each other.....	\$18.00
Cost of transportation of one ton delivered in San Francisco to Sacramento and Stockton less.....	7.00
Cost of one ton of charcoal pig iron delivered in San Francisco.....	25.00
Oregon pig iron per ton sells now, and never has sold for less than.....	46.00
Profit on one ton of pig iron selling same price as Oregon.....	\$31.00
Profit on 5000 tons of pig iron per year—5000 tons at \$31.....	\$155,000.00

We are not in a position to verify the correctness of this estimate, but our correspondent is confident that the figures

are within bounds. California certainly offers a good market for a home product of pig iron, as the consumption of the State amounts to about 200,000 tons of all kinds annually. We hope it will not be many years until the capitalists of California appreciate the importance and advantage of utilizing the large and varied supplies of good ores and limestone, and of timber available for charcoal. When local capitalists have learned from experience that their money can be employed to better advantage than in gambling in gold and silver mining stocks, iron manufacture will receive more attention than has hitherto been given it.

#### New Publications.

Illustrated Catalogue and Oarsman's Manual. E. Waters & Son, Troy, N. Y.: 494 pages.

The publishers in their preface give the following account of their original intention and the method in which they have since been modified: "When, in August, 1870, we gave notice of our intention of publishing an illustrated catalogue of our manufactures, our plan embraced a volume of some 200 pages, which should contain wood cuts of the principal varieties of boats we are prepared to build, accompanied by detailed descriptions of the rest, which, in connection with working drawings of such as were types of the rest, would enable rowing men to compare our boats with others with which they were familiar." It was then proposed to add hints on organizing boat clubs, a list of races won in paper boats, reports of races in which the public was especially interested, the Harvard and Yale and Oxford and Cambridge races, and the organization of various boat clubs in the States and British Provinces. During the preparation of the work constant inquiries from all parts of the country, relating to a multitude of details respecting rowing, training, records of time made in races, became so numerous that the only way of relieving themselves from the burden of the correspondence was to embody in the catalogue such information on these subjects as seemed most desired.

The first part gives a history of rowing in England and America, a history of modern racing boats, the modern racing shell, paper boats and their history and method of construction, with a chapter on details and another on selecting a boat. Part second is devoted to descriptions and illustrations of boats and fittings. The illustrations are very complete, showing both details and the lines of the various styles of boat are given on a large scale. The body plans are mostly one-third full size, and breadth plans one-twelfth. Part third is devoted to races, regattas, races won in paper boats, rules, and the Oxford and Cambridge annual races from 1829 to 1871, and also of the American college races down to 1871. Part four is devoted to the statistics of boat, rowing and hunting clubs of the United States and British Provinces, and is very complete. Part fifth is devoted to boat houses and their construction, with plans, elevations, estimates and details. The paper is tinted, the pages surrounded by a red line, the engravings fine, and the printing all that could be desired. Altogether it is the most complete work upon the subject which has yet appeared in this country.

Aside from the interest as a work giving a vast deal of information in regard to sporting matters, the book has a value in the eyes of the utilitarian. The use of paper for boats is but a step toward its practical application to a hundred kindred uses. An indestructible boat, capable of carrying a dozen men, and so light that two men can easily carry her with one hand each, is a practical result that can be well considered a step in the direction of practical improvement.

#### Virginia Minerals for the Centennial.

The following correspondence will be read with interest:

W. C. V. M. & G. S. R. R. Co.,  
ALEXANDRIA, VA., July 27, 1875.  
To the Editor of the Alexandria Gazette: DEAR SIR.—I have to request that you will publish through your columns for public information the following letters and plan, "to aid in developing the iron mineral resources of Virginia." Mr. Britton is a well known citizen of Philadelphia, who makes a specialty of the examination of iron ores, and possesses much experience and reputation in the line of his profession. The letter of Gov. Kemper shows his appreciation of the importance of the proposed measure, and readiness to co-operate in carrying it into effect. Any scheme which may tend to the development of our material wealth, and to the production of new values commends itself with special force to the people of Virginia in their present condition, and should receive prompt consideration. If Virginia is to realize any material progress in the future, she must abandon the miser's policy of burying her treasures in the ground, and adopt measures to make her mineral wealth available. Iron ores of superior quality are found along the lines of the principal railroads in the State, and upon the line of the Virginia Midland Railroad more than one vein (hematite and magnetic, or specular, ore) can be traced for one hundred miles continuously. The establishment of local furnaces, and the transportation of crude ores for the manufacture of iron elsewhere would create a valuable traffic for the railroads, and promote greatly the general prosperity. If Mr. Britton's plan can attract the investment of capital to the iron ores of Virginia it is surely worth the experiment, especially as the expense of putting it in operation is comparatively small. Asking the assistance of the press of the State in giving the matter publicity, I am, very respectfully yours, J. S. BARBOUR, President, &c.

THE IRON MASTERS' LABORATORY,  
No. 339 Walnut street,  
PHILADELPHIA, May 30th, 1875.  
John S. Barbour, Esq., President of the Washington City, Virginia Midland and Great Southern Railroad Company: DEAR SIR.—The accompanying paper, though hastily written, sets forth pretty clearly the plan I suggested more than a year ago as one that occurred to me the most feasible for soon bringing before the coun-

try correct information of the extent and value of the iron mineral resources of your State. A number of Virginia gentlemen have urged me to draw up such a paper and publish it; but for several reasons I have felt unwilling to do so. I now send it to you, though, for your consideration, and with the hope that if you concur in my views you will lay it before the other Virginia companies. Should they all also concur, and believe that I can aid in putting the plan into execution at once, my services, if requested, will be at their command for a limited period; but I would accept no compensation whatever, only asking that I shall be put to no personal expense. After there was a mutual concurrence and understanding in the matter between you, a very little time would be necessary to draw up the proper rules for government and carry out the details; probably not more than a week or two.

In establishing such a bureau there should be the most positive determination to conduct it in a manner that could but command for it at all times the fullest confidence of the community. Energy and intelligence should be most manifest in its management.

Very truly yours, etc.,  
J. BLODGET BRITTON.

#### A Project to aid in Developing the Iron Mineral Resources of Virginia.

First. An exhibition room of sufficient size, well lighted, centrally located and conveniently accessible, should be procured at Staunton, Charlottesville, Richmond or Alexandria, or, if permissible out of the State, at Washington, D. C. Next to the latter place, Alexandria would be the most convenient for visitors from the North. A change, though, from the place first decided upon could be readily made whenever found advisable.

Second. The room should be placed in charge of an intelligent and trustworthy attendant, who would be present and keep it open to visitors at least eight hours every day in the week.

Third. Publication should then be made in the newspapers throughout the State that an exhibition room for the receipt and display of iron ores had been established, stating where and in whose charge it was, and that it would be kept open and free to the public at large, and to which all persons owning iron ore property in Virginia were invited to send fair average samples of their iron mineral for exhibition, upon the condition that with each sample should also be sent a written communication, setting forth (first) the name and post office address of the person sending; (second) the exact location of the ore land, and probable quantity of the mineral upon it, or the area which the mineral covered; (third) whether the property was for sale or not, and if for sale, such other information as persons desiring to purchase would be apt to ask for. Each sample should be put in a neat slightly box of about a cubic foot capacity, with the lid screwed, not nailed on. The box should be plainly marked with the address of the exhibition room, and delivered to the railroad agent at the nearest station, with instructions to forward the same.

Fourth. The railroad companies of the State should consent to transport all such boxes free, but without any liability whatever for delay, damages or loss, to the depot nearest to the exhibition room, at which point such boxes should be subject to the order and control of the attendant in charge of the room.

Fifth. The attendant should, upon the receipt of each box, open and place it in a proper position in the exhibition room, so as to permit the contents thereof to be conveniently examined by all visitors. The written communication accompanying it, or a fair copy of the same, should be attached. The attendant should also answer letters of inquiry, give full verbal information to visitors when so requested by them, and make and keep a proper record of all business matters appertaining to his position.

Sixth. A metallurgical chemist or scientific expert in iron ores should periodically visit the exhibition room, and give instructions for the proper arrangement and classification of the samples, and for taking portions of the samples from the boxes for analysis, and also suggest and advise in other matters as seemed to him best to promote the object of the exhibition, viz: Public display of reliable samples of the iron mineral of the State, and communication to the public of correct information in relation to the same, with the view to aid in establishing and building up home iron and steel industries. All new discoveries of iron ore, and all new and important information in relation to the iron ores of the State, should be the knowledge of the attendant should be published at once. If deemed advisable not to confine the collection to iron ores only, all other minerals upon which important industries could be built up might be included.

Seventh. The matter should be undertaken and carried out by the railroad companies of the State. They can do it most effectively. Very little money would be required. A room could be procured at Alexandria for a low rent, and the salary of an attendant need not be large. Indeed, the whole annual expense could be brought within \$700 or \$800. The directors of the railroad company, whose depot was nearest to the exhibition room, should have full control in directing the local management of the matter, acting through their president. The expense of the exhibition should be borne by the Virginia Bureau of Iron Ores." After it was in successful operation the State would no doubt contribute to its support. If a creditable collection was made by the time of the opening of the Centennial Exposition, and one undoubtedly could be made by that time, the whole or any portion of it could be very readily removed to Philadelphia, and returned again when the exhibition was over.

Eighth. The iron ore existing in the State is immense. Many of the deposits are practically inexhaustible for ages to come. Pennsylvania has not any so extensive. Some of them afford mineral unusually free from injurious matter, and from which the highest grade of metal can be made. This I know positively, from numerous analyses made by myself. There is not the slightest doubt that iron can be made in Virginia for as low a price as anywhere else in the United States; and she ought to be among the foremost as a producer. But the public know almost nothing of her mineral wealth. Even her own citizens are exceedingly ignorant of it. What is needed now is putting into practice a well devised scheme for collecting from all quarters of the State the most reliable information upon the subject, and properly publishing it to the world. The one here suggested I believe to be the most feasible. The press generally throughout the State, I am sure, would endorse it, and soon create an enthusiastic feeling in its behalf among the people. It could be put into operation in less than 30 days. The railroad companies, one and all, would be the first to reap, and continue to reap, most largely of the benefits resulting from the establishment of iron works. A single first-class furnace would afford in freights alone annually not less than \$20,000. But will they consider the matter, and jointly act in it?

If the president of each company would at once approve of it in writing, and consent to carry the samples of mineral without charge, and to pay a portion of the expense, say a sum limited to \$200 or \$300 annually, for a definite period, nothing else would be necessary than a little prompt exertion of some competent person, authorized by and acting under instructions from the company having control of the

execution of the matter, in carrying out the details.

J. BLODGET BRITTON,  
The Iron Masters' Laboratory, Philadelphia.

COMMONWEALTH OF VIRGINIA,  
GOVERNOR'S OFFICE,  
RICHMOND, VA., 14 June, 1875.  
John S. Barbour, Esq.—DEAR SIR: I cordially approve and commend the plan suggested by Mr. J. Blodget Britton for exhibiting Virginia iron ores, and it seems to me well to provide at once and in the same way for the receipt and display of all the other valuable minerals found in this State.

The last House of Delegates passed, with my entire concurrence, a bill making an appropriation for exhibiting, at the Capitol, the minerals of the State, but the Senate failed to concur in the measure.

I trust the transportation companies of the State will carry the proposed scheme into effect, and I shall be happy to co-operate with them as far as possible. Very respectfully, etc.,  
J. L. KEMPER.

#### The Annual Wear and Tear of Railroads and their Demand for Manufactures.

BY E. D. MANSFIELD, LL. D.

There is a common idea that the comparative cessation of the construction of new roads will stop nearly all this kind of work (manufactures). Not so at all. Supposing that there is this year 75,000 miles of road in this country, then the wear and tear in iron and woodwork, bridges, refitting, etc., will amount to more than the cost of all the roads made in any one year, and the demand for work arising from wear and tear is of more importance than the entire new construction of roads. For example, the largest amount of new roads ever made in one year was 7000 miles. Now this is less than 16 per cent. of the whole amount of railroads. It is quite evident that the amount of iron and woodwork required for renewals will be quite up to and more than 10 per cent. of the whole. But let us make the calculation. Let us take Ohio as the unit, and some of our roads as special examples.

1.—RAILS LAID IN 1874.	
New iron.....	453.4
Re-rolled.....	532.5
Spliced and mended.....	149.9
Steel and steel capped.....	166.855
Total.....	1,262.755

Of this whole amount only about 270 miles were of new road (being the Chicago branch of the Baltimore Road, and the Marietta and Cleveland, and the new branch of the Marietta Road), the residue being new tracks and steel rails on the old roads. There was, therefore, in 1874, 1000 miles of new rail laid in Ohio. This must be fully 15 per cent. of all the rails laid. For example, the Lake Shore line laid 160 miles; the Cleveland and Pittsburgh, 90; the Hamilton and Dayton, 20; the Cincinnati and Muskingum Valley, 20, and so on. This kind of work will never cease; on the contrary, it will increase. Nearly all these roads must be double tracked.

2.—BRIDGES.	
Total number.....	942
Total length.....	190,000 feet.
Built within the year.....	109
Length.....	11,179 feet.

Here we see that the new bridges were 12 per cent. of the whole number, and nearly all were on old roads; so that here the 10 per cent. is exceeded. We need not add the particulars of trestles, tunnels, station houses, etc. The proportion of these given each year is even greater than that given above.

It is impossible, from the reports, to tell exactly how many locomotives and cars are renewed each year, but the amounts charged in expenses to locomotive power, and common observation on the constant appearance of new cars and new locomotives, and the additional fact that the new machinery is better and more expensive, make it certain that the renewals in machinery are even greater in proportion than on rails and bridges. Taking these facts in view, we are assured that the annual renewals of iron, wood and machinery employed in railroads, is even more than 10 per cent. of the entire original cost. This presents the subject of railroads in a new light. The same is almost equally true of the road beds; for with the double tracks, the new side tracks, the new stations and bridges, it is quite evident that the annual cost of new road beds must for several years to come be in proportion fully up to that of machinery. We have, therefore, arrived at the conclusion, that if no' another mile of new railroad were built in this country, there must be paid annually an amount equal to 10 per cent., at least, of the whole original cost, for iron, wood, machinery and labor. Let us now apply the practical conclusion to Ohio and the neighboring States. There are in Ohio 4300 miles of railway, which cost \$302,000,000, or \$70,000 per mile; there must, therefore, be paid out each year \$30,000,000 to keep these roads up to their full work. It may be said that the whole operating expenses are \$27,000,000. True, but that does not include any of the new work, such as side tracks, double tracks, branches, etc. It is obvious and well proved that railroad accounts are made to conceal rather than to explain the actual condition of the roads. But nearly all the \$27,000,000 operating expenses, all except conductors, brakemen, station keepers, etc., are expended in the way I have indicated. But allowing for all probable errors, there must be at least \$30,000,000 per annum expended in renewals in Ohio alone. In Indiana and Kentucky there are nearly 5000 miles, making, we may say, 9000 miles in these three States, or about one-eighth part of all in the United States. To keep these 9000 miles in good condition, by the renewal of rails, machinery, bridges, etc., will require at least \$45,000,000 per annum. We see, therefore, that the mere stopping of the construction of new roads does not stop railroad work at all. On the contrary, if there was never made another mile of railroad, the annual amounts paid for renewals and reconstruction would be greater than the average amounts annually paid out for new roads. But new roads have not ceased, and will not for 20 years. It is true, they will never be made

west of the Missouri in the same proportion they have been east; but there must be some lines in the milder territories of the continent, and it will be many years before they are supplied. The fact is, the railroad is an immense machine, and another generation will pass away before it is either complete or understood. The very introduction of this machine requires an immensity of capital and an army of laborers to keep it up.—*Railway Review.*

#### American Marksmanship.

An Irish paper, in speaking of the success of the American rifle team at Dollymount remarks:

"The success of the Americans is not to be wondered at, for they are part of a nation of forty millions of people, who are familiar with the rifle from their cradles."

Upon this the Chicago *Inter-Ocean* comments as follows:

"We had rather this had not been mentioned; but now that the thing is out, we don't mind confessing that we know a thing or two about the rifle. And why should we not, when we may be called upon at any moment to defend our firesides from the attacks of a savage foe; when the failure of the crops may require that we lay in a stock of venison, antelope and bear meat for a winter's supply of provisions; when the daring buffalo dashes with blind fury through our streets, and the supple catamount sneaks around our hen coops with blood in his eye? Why should we not be familiar with the rifle? Necessity compels practice, and practice makes perfect. To say that we are familiar with the rifle from our cradles, however, is something of an exaggeration, though of course it was not so intended. Rifles are scarcely ever handled by our children until they reach the age of eight or nine years. With infants, shot guns of an approved pattern are the favorite weapon. Some think that practice with pieces of this character, which require no very great delicacy or precision, impairs the nerve and encourages a slovenliness of aim incompatible with the unerring accuracy which must distinguish the successful rifleman; but we do not think the objection well taken. Practice with the shot-gun familiarizes a child with the sound of firearms, the proper attitude to assume and increases the boldness and confidence with which he meets and defies danger. Having attained these, a little careful practice gives him the steadiness required to the successful marksman, and enables him to knock down a pigeon at six or eight hundred yards with an ease that, to foreigners, is astonishing! Of course, being familiar with these sights, we do not regard them as anything extraordinary, but English visitors are amazed to see the proficiency of our children in this respect! A class of 6 or 8 year olds, called up for recitation in a public school, each with his shot-gun strapped to his back, and at a word from the teacher blazing away at a rough map of Europe locating the principal towns and cities by a charge of buckshot through the center of the various municipalities, is a sight that cannot be witnessed in the old country, and naturally calls forth expressions of praise and admiration from strangers who view this spectacle in America! It is thus, let us inform our worthy visitors, that the glorious principles of liberty are kept alive in the hearts of our youth, and the proud and independent American citizen is led to gaze with pity on the inexperienced marksmen of Great Britain. Not that we feel proud, for we do not. Situated as we are, they would undoubtedly shoot like Americans. It is our life that does it—our wild, free, unfettered existence."

A special exhibition of modern and antique furniture was lately opened in London, and at the inaugural ceremony a very interesting paper was read by an exhibitor, in which he gave the following account of one of the specimens on exhibition: "That," he said, pointing to a chair, "is the copy of a chair said to have belonged to King Dagobert, of France. The original is now in the Bibliotheque Nationale, and by the permission of the late Emperor Napoleon the reproduction now exhibited was made. Dagobert reigned in the seventh century. There is a complete account of the chair by Mons. Lenormant, in a French work entitled 'Melanges d'Archeologie,' who shows that the chair is one of two made, under special circumstances, for Clotaire II., the father of Dagobert. It appears that about the commencement of the seventh century there lived a clever metal worker and designer, who, before he was canonized and became St. Eloi, was known as Eligius. In the course of his career he came to Paris, and through the king's chamberlain brought himself to the notice of King Clotaire. Clotaire desired to have a fine throne of state, and, pleased with the accounts of St. Eloi's ability, he commanded him to undertake the making of a gold chair inlaid with precious stones. A large supply of gold was given to St. Eloi for the purpose, and the chair was commenced. But St. Eloi found it necessary to mix an alloy with the gold, and so obtain a material more convenient to work than pure and soft gold. The consequence was that his stock of gold was more than sufficient for one chair. Accordingly, when his first commission was executed, he made a second chair, in order to use up the whole of the gold supplied to him. At the appointed time he took his jeweled chair to the King, who was overcome with pleasure and admiration at the sight of so magnificent a work. St. Eloi explained how he had made it, and how that the gold which the king had given to him had been more than sufficient for the purpose, adding, 'In order not to waste what remained of the gold, I used it to make this second chair,' which he then uncovered and displayed to the king. The chair was of bronze, thickly gilt with the overplus of gold. Now this second chair is that which at present exists in the Bibliotheque Nationale in Paris. It was used by Dagobert when he succeeded to the throne of France. Later on it was preserved in the treasury of St. Denis, near Paris, and in the twelfth century the Abbe Suger, who was renowned for his decorative works in the abbey of St. Denis, restored certain portions of the chair, the back and upper portions of it."







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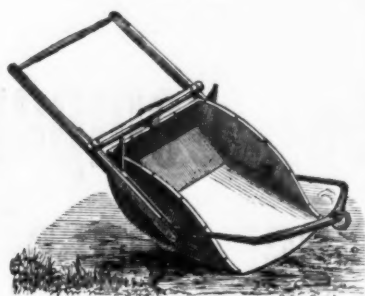
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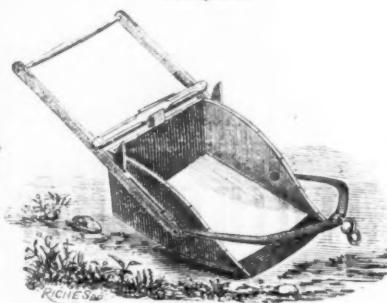
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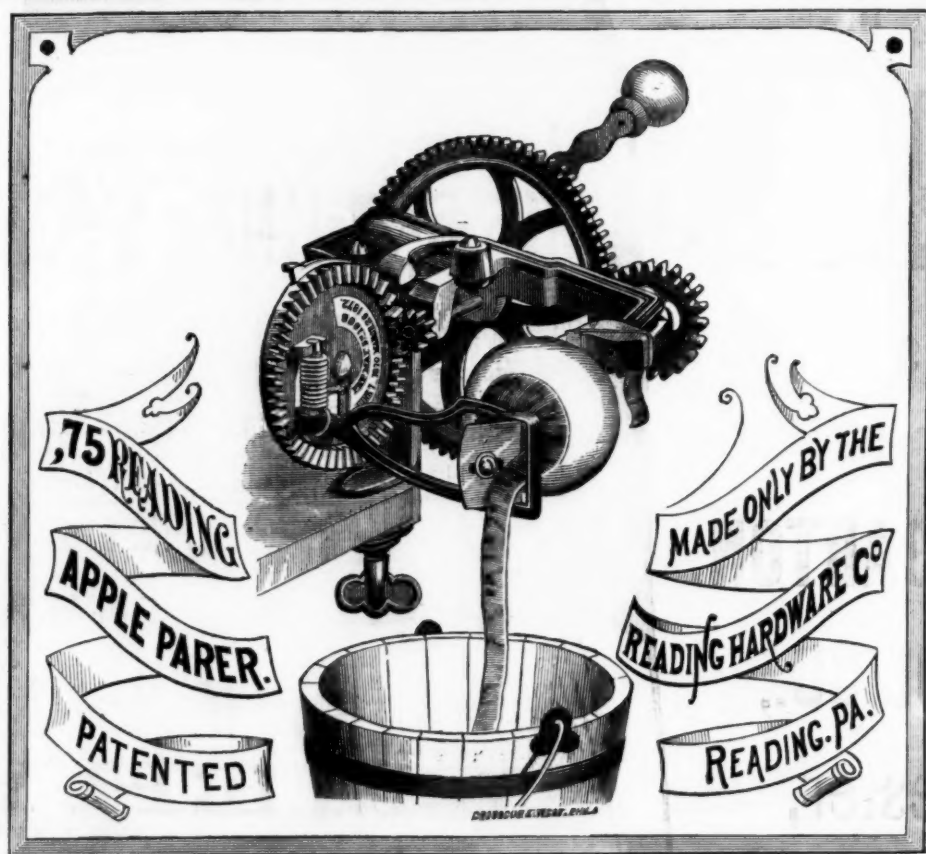
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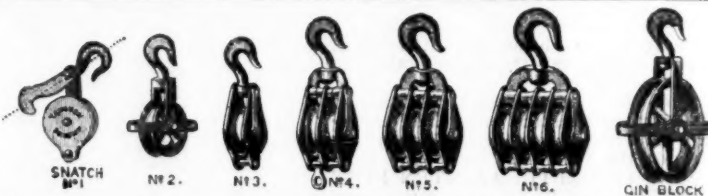
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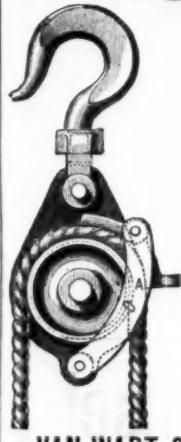
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Weston's Patent  
RATCHET DRILL.

Style "A" Six Sizes.

Five other styles made, all wrought  
iron.

Patent Self-Sustaining Rope Pulley Blocks.

Same as the ordinary block, but suspends the weight at any point.

Weston's Patent Differential Pulley Blocks.

Made from 1/2 ton size to 10 tons.

VAN WART & MCCOY, Sole Agents, 134 & 136 Duane St., N. Y.

## NEW YORK SCREW BOLT WORKS.

(Estate of R. J. DEWHURST, deceased.)

JOHN COCHRANE, Executive Agent and Manager,

Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, Forgings, &c

The attention of large consumers solicited.





## TACKS &amp; SHOE NAILS.

FACTORY, Fairhaven, Mass.

Made by the AMERICAN TACK CO.

SALESROOM, 117 Chambers St., N. Y.

Upholstery, Gimp, Brush, Card, Pall and Cheese Box Tacks; Leathered, Tinned and Iron Carpet Tacks; Bright and Blued Finishing Nails; Cigar Box and Chair Nails; Trunk and Clout Nails; Brads, Patent Brads, Copper Tacks and Nails; Iron, Zinc, Steel and Copper Shoe Nails; Polished 2d and 3d Fine Nails; Roofing and Slatting Nails; Roofing Tacks and Tinned Tacks and Nails of every variety. Any size or style of Tack or Nail made to sample. Orders sent to either Factory or Salesroom will receive prompt attention.

## WOODEN TOOTH



## Curry Comb.

The Best yet Invented.  
CHEAP AND DURABLE.  
Is Pleasant to the Horse, and does not injure the Brush.

FULLER BROS., Sole Agents,  
89 Chambers & 71 Reade Streets, N. Y.

## Lester Oil Co.

183 WATER ST., N. Y.

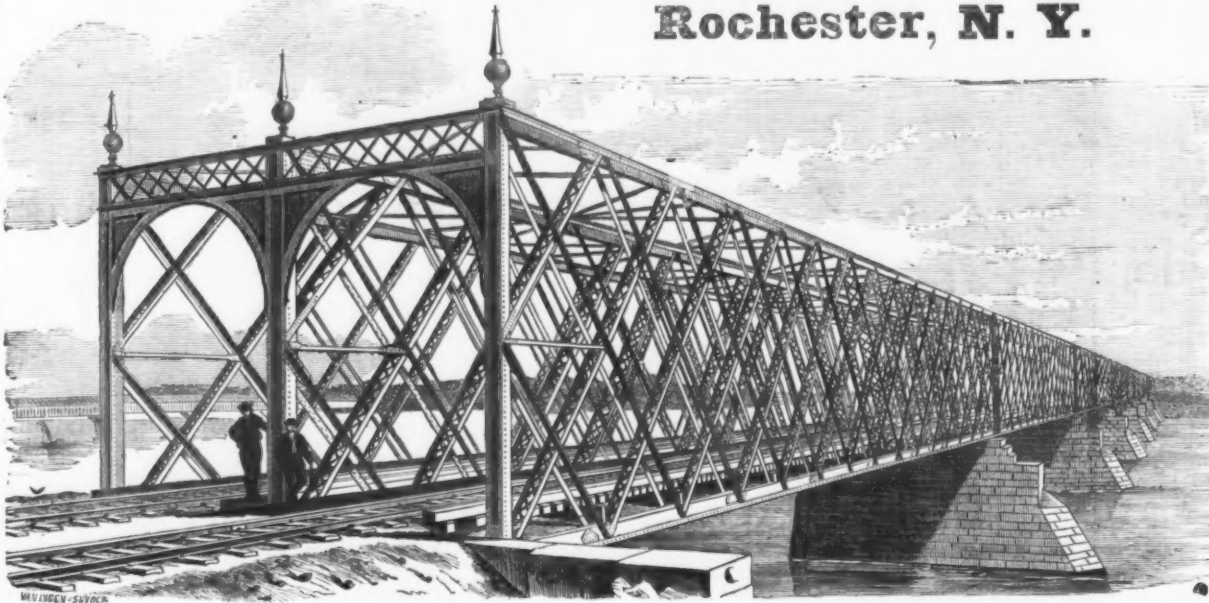
Exclusive manufacturers of the Renowned

## Synovial Lubricating OILS.

The most Durable, Reliable & Economical Lubricant in existence;  
Applicable to every grade of machinery. Send for Circular and Price List.

## LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.



Wrought Iron Riveted  
Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE,

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

"WEYMOUTH'S PATENT"  
Lightning HAY KNIFE,

Manufactured only by

HIRAM HOLT &amp; CO.,

East Wilton, Franklin Co., Me.

The Lightning Hay Knife is a perfect success, and is acknowledged by all who have tested its merits to be the BEST HAY KNIFE in use.

It combines the qualities of cutting EASY, FAST AND WELL and is a labor saving instrument.

The blade of this knife is Solid Cast Steel of such strength and temper as the tests require. It has the Spear Point, which enables it to enter the substance to be cut easily and in any direction desired.

The most valuable point in its construction is the SERRATED EDGE, being sharp only on the short angle, which comes obliquely in contact with the hay, at the downward motion, giving a drawing cut, which is the true principle of cutting hay.

The cutting surface being small it is kept in order much easier than the old smooth edge knife.

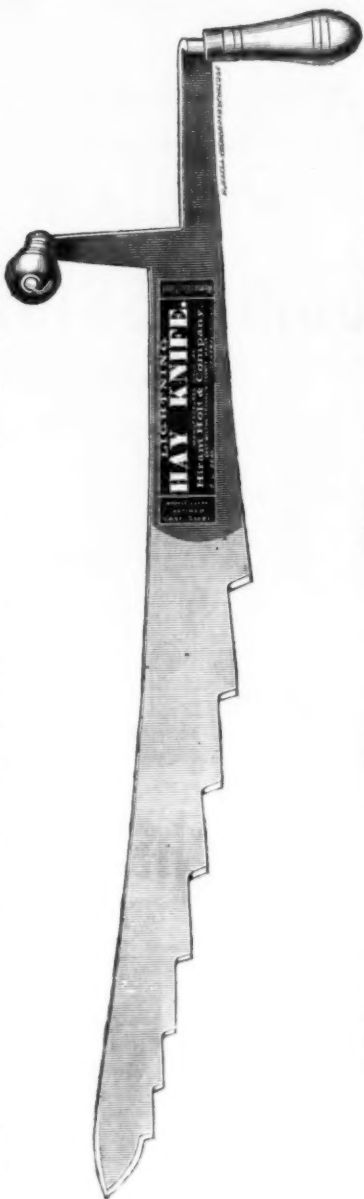
The handles (as seen in the cut) are so arranged that the operator can stand erect, and, having the use of both hands in applying his strength directly upon the knife, can, with ease, CUT TWO FEET IN DEPTH, AND TEN FEET IN LENGTH IN STACK OR MOW, IN ONE MINUTE.

It is not only valuable as a Hay Knife for dividing stacks and mows, but is a superior instrument for cutting hay from the bale, stack or mow, and corn stalks into fine feed, thus doing the work of hay cutters much faster than any other hay cutter in use. It also stands unrivaled by any implement yet invented in cutting peat, turf and muck, and ditching in marshes and meadows.

This knife, although a late invention, is fast taking the place of all other hay knives, and only requires testing to be adopted as the only hay knife which gives

PERFECT SATISFACTION.

It has received several first premiums and medals at the New England State Fairs, among which is a Silver Medal from Maine State Fair, 1874.



The D. R. Barton Tool Company,  
Sole Manufacturers of  
Genuine D. R. BARTON EDGE TOOLS.

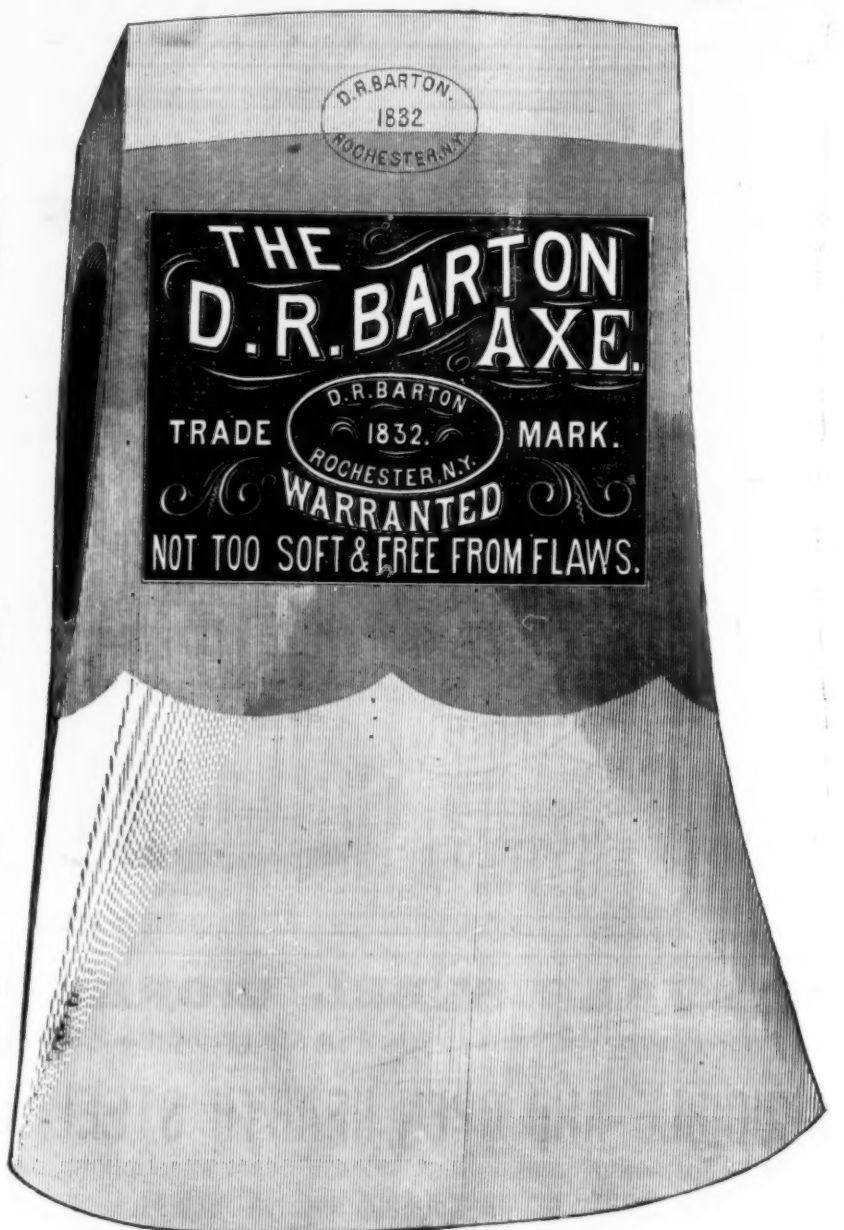
Established by  
D. R. BARTON,  
1832.

Incorporated by  
D. R. BARTON,  
1875.

For the  
BEST AXE  
MADE,

Address  
THE  
D. R. BARTON  
TOOL CO.,  
Rochester,  
N. Y.

Price Lists sent upon  
Application.



## The American Ice Chisel



Is superseding all others. It will save your time, save your ice, save your refrigerator, save your money. It shaves more rapidly than a Crusher, and splits as true as a saw. The blade is of the best English Steel, carefully tempered and plated to prevent rust. Address orders,

THE AMERICAN ICE CHISEL,  
100 Chambers Street, or P. O. Box 1402, New York.

## CONCORD AXLES

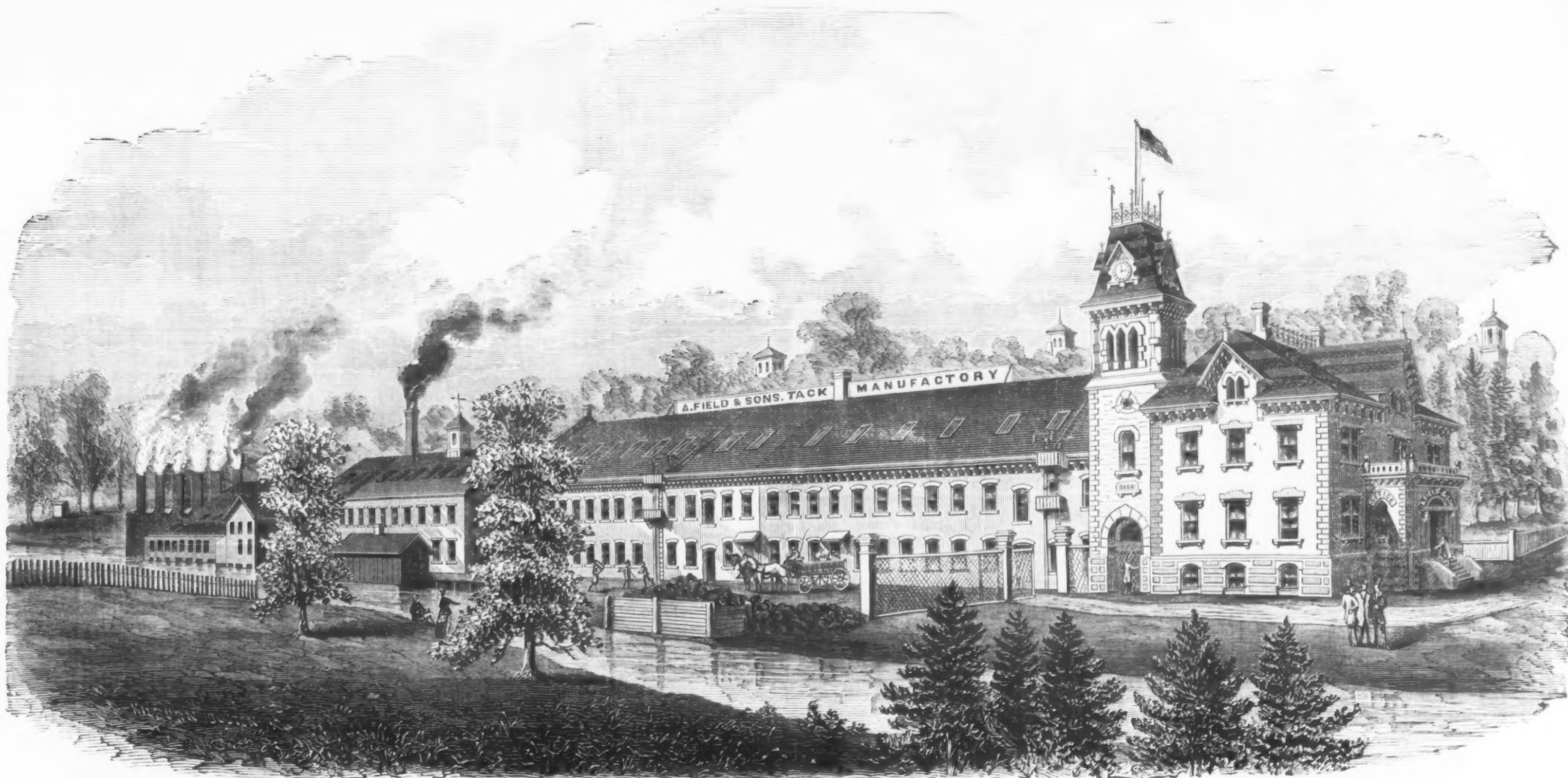
Will Run Easier, carry a Larger Load, and Wear Longer than any other Axle in the Market.  
All GENUINE Concord Axles are stamped with above trade mark. Manufactured only by  
D. ARTHUR BROWN & CO., Fisherville, Concord N. H.



"DRAW CUT"  
BUTCHERS' MACHINES,  
Choppers, Hand and Power.  
Stuffers,  
Lard Presses.  
Warranted thoroughly made and  
the BEST IN USE.  
MURRAY IRON WORKS,  
Burlington, Iowa.



ESTABLISHED 1827.



ENTIRE LENGTH OF WORKS, 700 FEET.

# A. FIELD & SONS,

## TAUNTON, MASS.

Manufacturers of

IRON  
COPPER  
TINNED  
SWEDES IRON  
UPHOLSTERERS'  
CARD CLOTHING  
PAIL AND TUB  
GIMP  
LACE  
PATENT COPPER PLATED  
LARGE HEAD CARPET

FINISHING  
TRUNK  
CLOUT  
CHAIR  
CIGAR BOX  
HUNGARIAN  
HOB  
SILVERED OR JAPANNED LINING  
SILVERED OR JAPANNED SADDLE  
TUFTING  
COPPER CUT

# TACKS

# NAILS

BRADS AND PATENT BRADS.

LEATHERED CARPET  
TINNED CARPET  
COLORED COATED CARPET  
COFFIN LINING  
MINERS'  
BRUSH  
LOOKING GLASS  
SHOE OR LASTING  
ROUND HEAD  
ROOFING  
EVERY STYLE OF

BOAT REGULAR  
BOAT CHISEL POINTED  
FINE TWO PENNY  
FINE THREE PENNY  
PATENT COPPER PLATED  
CHANNEL  
AMERICAN IRON SHOE  
SWEDES IRON SHOE  
ZINC SHOE  
STEEL SHOE  
CHARCOAL IRON SHOE

With New, Improved, and Patented Machinery, we shall now make

## GLAZIERS' POINTS,

ONE OF OUR SPECIALTIES.

Any variation from the regular size or shape of the above named goods made from samples to order.

QUALITY GUARANTEED TO BE SATISFACTORY.

OFFICES AND FACTORIES. - - - - - TAUNTON, MASS.

Warehouse and Salesroom at 78 Chambers Street, New York.



### The Works of The Edgar Thomson Steel Company, Limited.

The following description of these important works was furnished by the officers of the company, at the recent visit of the members of the American Society of Civil Engineers:

These works are located near the village of Braddock's, 11 miles east of Pittsburgh, on the main line of the Pennsylvania Railroad, and on the Connelleville Division of the Baltimore & Ohio Railroad.

A connection has already been made with the Pennsylvania Railroad, with both high and low level tracks in the yard of the works. This is to be extended to the Baltimore & Ohio Railroad during the present season. A bridge across the Monongahela River, a mile above the works, which is far advanced toward completion, will give immediate connection by the Pan Handle line with the entire railroad system West and Southwest, and eventually, by the Virginia & Charleston Railroad, with the whole upper Monongahela Valley.

The property of the company has a front of 3900 feet on the slack water level of the Monongahela River, and hence an outlet to the whole Ohio and Mississippi system of navigation.

The property is divided into three parts. The strip lying between the Pennsylvania Railroad and the county road is 300 feet by 1800 feet; that lying between the Pennsylvania Railroad and the Baltimore & Ohio is 600 feet by 1500 feet; and that lying next to the river, a part of which is occasionally overflowed, is 1000 feet by 3000 feet. The whole comprises about 100 acres.

The buildings now erected are as follows: Cupola house, 107 feet long, 44 feet wide and 46 feet high. Converting house, 129 feet long, 84 feet wide and 30 feet high. House for blowing engines, 54 feet long, 48 feet wide and 30 feet high. Boiler house, 178 feet long, 40 feet wide and 18 feet high. Producer house, 90 feet long, 46 feet wide and 26 feet high. Rail mill, 390 feet long, 100 feet wide and 25 feet high, with a wing 100 feet long, 35 feet wide and 17 feet high. Office and shop building, 200 feet long, 60 feet wide and 18 feet high. A coal and iron house, 40 feet long, 20 feet wide and 10 feet high. The producer house and rail mill have iron side columns with timber side framing. All the others are wholly of brick, and all, without exception, have iron roof frames and coverings.

The Converting Machinery comprises 8 cupolas, 5 feet clear diameter, and 40 feet high; 4 spiral cupolas, 2 feet diameter, and 40 feet high; two 12 ton cupola ladles upon scales; two 5 ton converters, 6 feet clear diameter by 15 feet high; 13 crane ladles for casting, and a full equipment of ingot molds and flasks for bottom casting. Ample oven capacity is provided for drying spare bottoms for the converters, the flasks and ladle stoppers. A crusher and a mixing mill of approved patterns are placed in the cupola house, in which also is ample room for storage of refractory materials required for immediate use.

The Steam Machinery comprises 16 tubular boilers, 5 feet diameter by 15 feet long, each having forty 4 1/2 inch tubes, a separate grate, 5 feet 6 inches wide by 7 feet long, and a separate chimney, lined with brick, 2 feet 6 inches clear diameter, by 75 feet high from the ground.

Each boiler has independent lined safety valve, feed valve and blow off valve; and any one boiler can be used or repaired independently of all the rest. The two blowing engines for the converters have 42 inch steam cylinders and 48 inch stroke. Each has two 30 ton fly wheels, a balanced slide valve on the steam cylinder, and rubber faced poppet valves on the air cylinder. The moving parts are balanced by an auxiliary piston and a small steam cylinder. A duplex blowing engine is used for the cupolas, with 18 inch steam cylinder, 60 inch air cylinders and 36 inch stroke. A horizontal engine, in the cupola house, with an 18 by 24 inch cylinder, drives the crushing and grinding machines. A horizontal engine, 36 inch diameter, by 48 inch stroke, with a 25 foot 50 ton fly-wheel, drives the blowing mill; and a similar engine, 46 inches diameter, by 48 inch stroke, drives the rail mill. A 3 ton hammer is placed for cutting the blooms, and for such hot chipping as may be needed. An engine, 16 inches by 12 inches, drives the rail saws, and one, 18 inches by 24 inches, the straightening presses, the slotting machines, and the drills for fish plate holes. Two heaters of the largest size will be connected for the supply of the boilers with hot filtered water. The boilers are fed by two duplex pumps, 10 inch by 5 1/2 inch, by 10 inch stroke, each having a direct cold water supply, and also a connection to either one of the two heaters. All the principal pipes are laid under ground in brick tunnels, so that they are quite accessible at all times.

The Hydraulic Machinery comprises: One duplex pressure pump, with 25 inch steam cylinders, 9 inch water plungers, and 24 inch stroke, and one pressure pump, 30 inch and 7 1/2 inch by 15 inch stroke; a complete distributing apparatus, all valves of which are connected to a common platform; two accumulators, 16 1/2 inches diameter by 9 feet stroke; a ladle crane, 15 1/2 inches diameter by 6 feet stroke; four cranes, 13 inches diameter by 9 feet stroke, three for lifting ingots, and one for the bottom casting flasks; two cylinders, 18 inches diameter by 9 feet stroke, with racks and pinions for rotating the converters; one cylinder, 12 inches diameter by 24 inch stroke, fixed upon a car, for lifting and removing the bottoms of the converters; and two lifts, 9 inches diameter by 27 feet stroke, for raising materials in the cupola house.

The Heating Furnace Plant comprises 20 gas producers in 5 blocks, a sheet iron cooling tube leading overhead to the brick gas flues, and 6 Siemens' furnaces, each 8 feet wide by 20 feet long, inside of the walls. There are two chim-

neys, each 6 feet diameter, and 98 feet high. Three of the furnaces will have hydraulic machinery for charging the ingots, as brought red hot from the converting house, and also for drawing them for rolling.

Rolling Mill Plant.—The ingots are bloomed in a 30 inch 3 high mill, which is fitted with feeding rollers, driven by an independent engine, and with hydraulic cylinders for moving the roller tables for turning over the ingots, and for moving the middle roller to vary the sizes of the grooves as required. A "telegraph" leads to the hammer, and a steam crane piles up the ingots in the yard whenever it becomes inconvenient to take them direct to the reheating furnaces, for the rail train.

A 23 inch 3-high train is used for rolling rails with three sets of rolls. A line of driven rollers leads to the saw carriage, and a second line of driven rollers leads to a 60 feet hot straightening plate. Space is provided for a swinging saw for cutting double length rails. The hooks for handling the rails and the rolls will be fitted with a power lifting apparatus, to secure greater rapidity of working. The usual appliances are provided for finishing and shipping the rails.

Water Supply.—The water supply is brought from the river, a distance of 1800 feet, through a 20 inch glazed sewer pipe. Entrance pipes are placed at the river bank, and the pipe throughout its whole length is placed at such a level that the water will flow at the lowest stage of the river into a well near the works. Two duplex pumps, each 30 inch by 7 1/2 inch, by 15 inch stroke, are placed at this well, and are supplied from the main steam pipe, and will be regulated by valve in boiler house, moved by a float. An 8 inch pipe discharges from these pumps into a 20,000 gallon tank, from which supply pipes are led to the pumps in the works.

A complete system of 30 inch railroad tracks has been arranged for the carriage of materials throughout the establishment and for the removal of all debris.

A store room, laboratory and engineer's offices, are provided for in the same building with the machine shop. The latter contains a 54 inch lathe for roll turning, one 30 inch and one 16 inch lathe, a 30 inch planer, two drills, a pipe cutter and a screw cutting machine, all being driven by a 12 inch by 18 inch engine. In the smith shop are 3 fires, a 1000 lb. steam hammer, and an upright steam boiler.

Experience in other works of a similar character has shown that a product may fairly be looked for, in each 24 hours, of 200 tons of ingots, and of 225 tons of rails, if rolled in double lengths, and of 200 tons if rolled single lengths.

### Street Scenes in Dresden.

A writer in the *American Exchange and Review* says:

That Dresden is a healthy place of residence, as some have imagined, is a fallacy which can be cured by remaining there a few seasons. A chronic mania for tearing up and digging up streets seems to pervade the community, and from the everlasting gaping trenches malarial fevers and small pox appear to arise. Notwithstanding this drawback, there are many elements of interest and beauty in this old city.

The Haupt strasse, which for about a mile forms one of the five names by which the main thoroughfare running north and south is distinguished, is nearly 300 feet wide, having in the center a broad walk bordered with trees. The buildings on it are not handsome, and it is only lately that any decent sidewalks have begun to appear on this or any other of the streets of Dresden. The inhabitants seem not yet to be at home upon these, and all classes quite as frequently use the middle of the street as the pavements. Many of the dwellings seem like lifeless shells, or large hotels devoid of guests, and although the halls and entrances are regularly washed, there is perceptible a most unwelcome and all-pervading odor. The houses on the narrow streets are very odd; and, beside these, the gay uniforms of the royal messengers, the spiked helmets and trappings of the numerous soldiers, and the scanty petticoats and curious costumes of the bare-legged peasant girls, make the scene picturesque. There is a dim gloominess in the narrow by-ways, and the tall, uneven gables of the houses threaten to topple over. Although there are long fronts of new sandstone palaces, and fine offices and residences on the Reich strasse and Bismarck platz, the older and less pretentious part of the city has more attractive scenes. Dresden abounds in squares and market places of great size, compared with the narrow streets. There is nothing more broadly striking and amusing than the markets and outdoor fairs, some of the latter being only temporary, with gaily bedecked booths, attended by rotund and witty country dames. Three or four times a year, but notably toward Christmas, is the city peculiarly alive. A grand carnival and celebration takes place about Christmas, and is known as the Jahr-Markt, or Christmas Fair. It continues for a week or ten days.

Dresden has lately had an excitement by the introduction of its first tramway cars. They are large and comfortable, and like those of London and Paris, have seats on top. The bridges of the city are of superior architecture, and the motley crowds and curious scenes thereon form singular tableaux.

A marvelous piece of mechanism in the way of clocks is described in the French journals. It is an eight-day instrument, with dead beat escapement maintaining power. It chimes the quarters, plays sixteen tunes, plays three tunes every twelve hours, or will play at any time required. The hands go round as follows: One, once a minute; one, once an hour; one, once a week; one, once a month; one, once a year. It shows the moon's age, the rising and

setting of the sun, the time of high and low water, half ebb and half flood, and, by a beautiful contrivance, there is a part which represents the water, which rises and falls, lifting some ships at high water tide as if they were in motion, and, as it recedes, leaves these little automaton ships dry on the sands. The clock shows the hour of the day, day of the week, day of the month, month of the year, and in the day of the month there is provision made for the long and short months. It shows the signs of the zodiac; it strikes or not, chimes or not, as may be desired; and it has the equation table, showing the difference of clock and sun every day in the year.

In our issue of last week a typographical error occurred in the address of Mr. C. A. Ford, the agent for Mr. F. A. Gleason's new nail cutting machine. The address should have been C. A. Ford, 241 Front street, New York city.

Mr. C. H. Nimson has been appointed superintendent of the Allentown Rolling Mill Works, Mr. L. H. Gross having resigned on Wednesday last.

### Special Notices.

#### Furnace Engineering.

Plans, Estimates and Superintendence FOR BUILDING OR REPAIRING.

Reliable Analyses Furnished, and Advice given concerning the Value of Materials, Best Mixtures & Methods of Working.

Special Attention paid to Investigating Cases of Unsatisfactory Results.

Furnace companies supplied with first-class men for all positions. Competent managers and founders desiring situations are requested to send full particulars. Correspondence solicited on all topics of interest in furnace work. Letters answered promptly without charge. Address:

EDWARD J. WALL, Jr., Blast Furnace Engineer,

438 Franklin Street, BUFFALO, N. Y.

#### For Sale, Hardware Store.

A first-class Hardware Store for sale, wholesale and retail, situated in best part of the city, on main street; railroad depots on both sides of street, one opposite and one four doors distant; store well established; investigation invited. Satisfactory reasons given for selling. Capital required about \$10,000. Address: HARDWARE, No. 71 Federal St., Allegheny, Pa.

**WANTED.**—A situation either as salesman or traveler, by a man who has had many years' experience in the general and carriage hardware business. Is an active working man, and can refer to first-class houses in the trade, based on an acquaintance of twenty years. Address, HARDWARE, Box 658, Rochester, N. Y.

### HARDWARE.

**FOR SALE** in the best business part of Jersey City, a first-class Tool and Hardware business. Established about 25 years, and doing a fair business.

Apply to **H. LUTTGEN,**  
57 Montgomery St., Jersey City.

### Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE.

No. 258 Broadway, New York.  
**A. V. BRIESEN.**

### TO LET, A Light, Handsome Office.

Possession Immediately.  
**HERMANN BOKER & CO.,**  
101 Duane Street, N. Y.

### REMOVAL.

We have Removed our office and stock of Cutlery to  
**107 Duane St.**  
**PETERS BROTHERS.**

**WANTED.**—A situation by a young man having had ten years' experience in the Hardware and Stove Business, either as clerk or salesman, or would travel. Hardware preferred.  
Address, **M. J.,**  
Office of *The Iron Age*, 10 Warren St., N. Y.

### Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.

**GILCHRIST & GRIFFITH,**  
Mount Pleasant, Iowa.

### A. PURVES & SON,

Corner South & Penn Streets, Phila., Dealers in  
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry  
Facings. Best Quality Ingot Brass.  
Cash paid for all kinds of Metals and Tools.

**WANTED.**—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desiring a responsible position. References satisfactory. Address,  
**IRON AND STEEL,**  
Care of P. O. Box 513, Bridgeport, Conn.

### CHARLES GOOCH,

Commission Dealer in  
**Patented Articles and Hardware.**  
436 Market St., PHILADELPHIA.  
Manufacturers who wish to make arrangements for the sale of desirable articles are invited to correspond.

### Special Notices.

#### Important to Manufacturers.

**BISSELL, WELLES & MILLET,**  
Auctioneers and Commission Merchants, No. 15 Murray St., New York.  
Solicit from Manufacturers and others consignments of Hardware and Cutlery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances made if desired.

#### DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of.

#### Iron and Steel Drop Forgings

in quantities to order at reasonable rates.  
**HERMANN BOKER & CO., Proprietors,**  
101 & 103 Duane St., N. Y.

#### McHaffie Direct Steel Castings Co.

**STEEL CASTINGS,**  
Solid and Homogeneous, guaranteed to stand a Tensile Strain of 25 tons per square inch. An invaluable substitute for expensive WROUGHT IRON FORGINGS or for Iron Castings, where great strength is required. Office, cor. Ewing and Leavitt Sts., PHILADELPHIA.  
Send for Circular and Price List.

### Wanted.

A man for Superintendent of a Malleable Iron Works. Must have experience. Address  
**St. Louis Malleable Iron Co.,**  
St. Louis, Mo.

### MANUFACTURERS

desire of introducing their goods to the British and Continental Markets, are advised to insert advertisements in the newspaper "IRON," published every Saturday, at 99 Cannon Street, London, E. C.

SCALE: First 3 lines, 3/4; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

### For Sale.

### For Sale.

Car Shop in Conshohocken, Pa., 50x100 ft. fronting on P. and H. R. R., with blacksmith shop 20x30 ft., engine house 15x20, 20 horse engine, and all the modern machinery necessary. The lot is 135x300 ft. For particulars call on or address,

**HUTCHINSON & FAGAN,**  
Norristown, Pa.

### FOR SALE.

**Rolling Mill and Bridge Building Machinery, OF NEW ENGLAND IRON COMPANY.**

Upright Corlies Engine, 39 in. cylinder, 5 ft. stroke; wheel, 33 tons, 35 ft. diam.  
Padding Train, Merchant Train, 16 in., built by Totten.  
Rotary Squeezer, Etc., Etc.  
Testing Machine.  
Bolt Cutters.  
Milling Machines, and all Machinery necessary for Bridge Work. In lots to suit. Apply to

**WM. E. COFFIN & CO.,**  
8 Oliver Street, Boston.

### FOR SALE, HARDWARE BUSINESS.

Wishing to engage in other business, we offer our stock of Hardware For Sale on reasonable terms. Our stock comprises: Stoves, Tin ware, Sheet Hardware, &c., and has been selected with care and bought at low cash prices. To a person wishing to engage in business this offers inducements. Stock will invoice about \$6000. For particulars, address,  
**BOX 5, Lima, N. Y.**

### DISCOUNT LISTS.

W. Butts and C. Butts, 13 discounts..... each 75c  
Iron Screws & C. & P. Bolts 13 discounts..... " 75c  
**DATTON & LAMBERSON,**  
97 Chambers Street, N. Y.

### For Sale.

A clean and complete stock of Hardware, Tin and Stoves, with the good will of an old and well established trade. Room centrally located and been used for same business for 25 years past, and in one of the most substantial and rapidly growing cities of Northern Ohio. Do a business of about \$75,000 per year, and will invoice about \$30,000. Will sell Hardware separate if desired. Good and satisfactory reasons given for selling. Apply to, or address,  
**MYERS & WILLIAMS, Tiffin, Ohio.**

### For Sale.

A prosperous and well known Hardware Manufacturing business in one of the most thriving towns in New England. A rare opportunity for moderate capital. None but those meaning business need apply. Address,  
**P. O. Box A,**  
Franklin Falls, N. H.

### Charcoal Furnace for Sale

Near Cartersville, Ga. Complete, ready to run. With Brown Hematite Ores, greatest abundance. Also, two beds Manganese—lands in fee simple. Price, \$12,000—offered at this figure only because it must be sold at once.  
**S. B. LOWE, Chattanooga, Tenn.**

### SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866; and July 2, 1866. There is a special claim on each of the Dies. All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**  
DEER RIVER, Conn., Sept. 7, 1874.

### Charcoal Blast Furnaces.

Having during the past 10 years constructed and put in operation a number of the most successful Charcoal Blast Furnaces in the country, and having a competent corps of workmen constantly in my employ, I am enabled to offer advantages in constructing or remodeling upon the latest and most approved plans. Examinations of Furnace Property made and reported upon when solicited. Correspondence promptly attended to.  
**J. M. WHITE, Engineer,**  
22 W. Alexander St., Rochester, N. Y.

### For Sale, &c.

#### Iron Ore & Mineral Lands,

Thirty thousand acres, abounding in the several varieties of Hematite and Magnetic ores, covered with timber; limestone abundant; contiguous to one of the largest Railroads leading east and west, low freights insured; coal within 20 miles of Works. Consists of Charcoal Furnace and Forge of 300 tons a month capacity; fine manager's house, large store, stables and workmen's houses, &c. Labor 75c. a day; cost of Charcoal, 5c. a bushel; iron ore, \$1.75 a ton; lime stone, 80c., all delivered at Furnace. Freight to Pittsburgh, \$3.50, Baltimore, \$3.40. Ores can be placed in Pittsburgh almost beyond competition. For sale, or will be operated jointly.  
Address, **P. O. Box 365, Baltimore, Md.**

#### For Sale! Hardware Business

In a growing manufacturing town, one of the best locations in Vermont. Business well established and profitable. Stock about \$10,000, in good order. This affords an excellent opportunity for a party with small capital to secure a paying business.  
Address, **W. H. BIXBY & SON,**  
Vergennes, Vt.

### For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington, Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an "A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about \$15,000, in good order. At a sacrifice. Ample reasons given for selling. For further information, address,  
**GEO. BRADNER, Bloomington, Ills.**

### FOR SALE.

An 1/4 inch mill train for making Merchant, Band and op Iron. Will be sold cheap.  
Apply to **W. W. JONES,**  
Near the Lehigh Valley Railroad Depot,  
Allentown, Pa.

### FOUNDRY PROPERTY FOR SALE,

Or to lease with privilege to buy: consisting of Foundry, Machine Shop, with powerful steam engines, and other buildings. Water front on North River, Peekskill, 42 miles from New York, comprising 2 1/2 acres. Apply for particulars to  
**Box 332, P. O., Peekskill, N. Y.**

### To Stove Manufacturers and Foundrymen.

**The Carbon Stove Company,**  
Of Burlington, N. J.,

Will sell their Foundry, with all its appurtenances, business and good will, upon very liberal and accommodating terms, offering to any party wishing to engage in the Stove or general Foundry Business a rare opportunity.

The Foundry Buildings, which are of a capacity to employ forty or more molders, are very conveniently located upon navigable tide water on one side, and the Pennsylvania Railroad, with its freight station in front, being on the direct line between New York and Philadelphia.

The Buildings, Machinery and Appliances are all in prime order, and the assortment of Patterns, &c., for Stove, Range or Heater work, unsurpassed. Address, for terms or other particulars,  
**CARBON STOVE CO., Burlington, N. J.**

### For Sale, Hardware Business

In successful operation since 1845. Rare opportunity to secure an old and established business. Stock of General Hardware, Iron, Nails, &c., &c., will invoice \$6000 to \$8000. Two story brick business room, 22x30, with cellar under all, for \$5000. After first payment will make such terms as will be easy, and cannot fail to suit purchaser. Will assist purchaser at starting, if necessary. Satisfactory reasons for selling will be given. Address,  
**C. U. RAYMOND,**  
Cambridge City, Wayne Co., Ind.

**A BLAST FURNACE FOR SALE** at the Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a capacity of 30 tons per day Anthracite or 15 tons of Charcoal, together with a splendid water-power, goes with the furnace. The furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.  
Address, **H. RANGE,**  
94 Gold Street, New York City.

### FOR SALE.

At Lowest Manufacturers' Rates,  
**GUNS & SHEET ZINC,**  
Best German and Belgian Brands,  
By **LOUIS WINDMULLER & ROELKER,**  
20 Reade Street, N. Y.

### For Sale, Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 15 men.

### Present Stock about \$6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address

**HORSMAN & HORSMAN,**  
Iron and Hardware Merchants,  
St. Thomas, Canada West.

### FOR SALE,

at 10c. a copy, general Spanish Weekly Market Review, written and published by the subscriber. 5 August, 1875, number 201, circulating in Mexico, the West Indies, Central and South America, including Brazil, Spain and Manila, on which certain standard articles of American manufacture are quoted. Specimen Copies sent free. The undersigned is also

Translator for Manufacturers and Land Companies, from and into the  
**ENGLISH, SPANISH, FRENCH, and GERMAN.**

Spanish Catalogues got up correctly and with despatch. Address, **C. KIRCHHOFF,**  
Metal Reporter of "The Iron Age,"  
Box 2091, N. Y.



# Trade Report.

Office of THE IRON AGE  
WEDNESDAY EVENING, August 4, 1875.

During the week past the financial markets have recovered from the excitement occasioned last week by the suspension of the banking house of Duncan, Sherman & Co., and everything has relapsed into the usual midsummer quiet. As we stated last week, there was no occasion for the fear that the failure of this house would usher in another panic. No further suspensions directly traceable to this cause have been reported, and every day has witnessed an improvement in the tone of the financial markets. The only present menace to the gradual recovery of confidence and a return of nominal prosperity seems to be the fear that the unusually heavy rains of the past fortnight will do serious and wide-spread damage to the crops. Consequently, there is no active speculation in breadstuffs, and prices have advanced. What damage has actually been done cannot now be estimated, but from such advances as we have, we conclude that the total loss to the country in the destruction of crops and the permanent injury of priced property has not thus far been so great as to warrant any fears of a scant harvest. At the Produce Exchange the damage to grain is estimated at 2 per cent of the entire crop. Money continued very abundant and easy, borrowers on call being accommodated at 1½ @ 3 per cent.

The gold market has been fairly steady, and the premium has fluctuated between 118½ and 119½. On Thursday the Treasury sold \$1,000,000 coin at 119-51½ @ 119-66. The following shows the daily range of the premium:

	Highest.	Lowest.
Thursday.....	119½	119½
Friday.....	119½	119½
Saturday.....	119½	119½
Sunday.....	119½	119½
Tuesday.....	119½	119½
Wednesday.....	119½	119½

Government bonds have moved in close sympathy with gold. The investment demand continues active. The currency question agitation, and the demand for inflation, which is popularly supposed to express the views of the people of the West, has not shaken the faith of the people in the credit of the government, nor in its willingness to pay its debts in coin—especially its demands, liabilities which are the most important of its debts, because they constitute our present currency. When the politicians are through talking the people will decide the question, and we have as yet no reason to doubt that the climax will be reached in favor of a return to specie payments by the easiest and safest, if not the shortest, road. Railroad bonds are strong and still in good demand for investment. We give below the closing quotations of government bonds.

In the stock market there has been no speculative excitement, but prices have strengthened. The most active shares have been Western Union, Pacific Mail, Lake Shore, Ohio and Mississippi, Northwest and St. Paul. Below we give the highest and lowest quotations of shares on the active list of the stock exchange.

The bank statement shows a loss in specie on the six days averages ending last evening of \$1,782,200, and a gain of \$518,900 in legal tender notes, making a reduction in total reserve of \$1,263,300. The loans have been increased \$1,358,500, and represent the increased demand for mercantile credits incident to the opening of the fall trade which is now taking place. The surplus reserve of the banks is down \$997,775, but this surplus is still the unusually large amount of \$28,504,675. The following is a comparison of the bank averages for the past two weeks:

	July 24.	July 31.	Differences.
Loans.....	\$277,540,900	\$278,507,700	Inc. \$1,966,800
Specie.....	17,519,400	15,737,200	Dec. 1,782,200
Leg. tend.....	75,015,290	75,534,000	Inc. 518,710
Deposits.....	252,128,600	251,056,100	Dec. 1,072,500
Circulation.....	18,599,400	18,576,100	Dec. 23,300

The foreign trade movements for the week are shown in the following tables:

	1873.	1874.	1875.
Total for week.....	\$5,412,063	\$7,308,727	\$5,808,769
Prev. reported.....	\$40,145,973	\$39,175,023	\$40,100,708

Since Jan. 1.....\$245,558,000 \$246,393,750 \$205,904,531

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Brass goods.....	14	1,447
Bronzes.....	14	3,015
Chains and anchors.....	49	3,105
Copper.....	4,662	4,662
Cutlery.....	145	45,876
Guns.....	45	11,341
Hardware.....	29	2,750
Iron, pig, tons.....	725	12,852
Iron, sheet, tons.....	105	20,781
Iron, R. R. bars.....	3,970	64,540
Iron, cotton ties.....	1,090	8,167
Iron, other, tons.....	328	22,910
Lead, pigs.....	7,135	1,135
Metal goods.....	151	21,772
Needles.....	59	840
Plated ware.....	13	1,825
Per. caps.....	4	463
Saddlery.....	6	1,687
Steel.....	1,322	24,122
Spelter.....	54,341	2,930
Tin, boxes.....	15,897	112,015
Tin, slabs, 682 lbs.....	71,333	12,010
Wire.....	247	1,666
Zinc.....	108,599	6,960

EXPORTS, EXCLUSIVE OF SPECIE.  
For the week.....\$6,096,224 \$5,157,917 \$4,325,682  
Prev. reported.....169,595,596 160,505,100 148,952,317

Since Jan. 1.....\$168,999,130 \$175,763,000 \$148,977,999

EXPORTS OF SPECIE.  
Total for the week.....\$230,595  
Previously reported.....59,682,301

Total since January 1, 1875.....\$59,916,966  
Same time in 1874.....39,555,097  
Same time in 1873.....37,295,328  
Same time in 1872.....33,163,750

Government bonds at the close were steady at the following quotations:

	Bid.	Asked.
U. S. Currency 6's.....	122½	123½
U. S. 6s 1861, reg.....	120½	121½
U. S. 6s 1861, con.....	120½	121½
U. S. 5-30 1864, reg.....	115½	116½
U. S. 5-30 1864, con.....	115½	116½
U. S. 5-30 1865, reg.....	115½	116½

U. S. 5-30 1865, con.....	119	119½
U. S. 5-30 1865, reg. new.....	118½	119½
U. S. 5-30 1865, con.....	118½	119½
U. S. 5-30 1867, reg.....	120½	121½
U. S. 5-30 1867, con.....	120½	121½
U. S. 5-30 1868, con.....	120½	121½
U. S. 5-30 1868, con.....	120½	121½
U. S. 10-40 reg.....	114½	115½
U. S. 10-40 con.....	117½	118½
U. S. 5s 1861, reg.....	115½	116½
U. S. 5s 1861, con.....	115½	116½

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated.....	103½	103½
Lake Shore.....	61½	61½
Rock Island.....	105½	105½
New Jersey Central.....	109½	109½
Illinois Central.....	97	96½
Wabash.....	5½	5½
Canton Land Co.....	50	50
Western Union Telegraph.....	88½	88½
Atlantic and Pacific Telegraph.....	19	18½
Northwestern.....	42½	41½
Prof.....	35½	35½
Milwaukee & St. Paul.....	39½	39½
Ohio & Mississippi.....	14½	14½
Union Pacific.....	19½	19½
Hannibal & St. Joseph.....	24	23
Mariposa.....	12	11½

## GENERAL HARDWARE.

There are in the city at present a larger number of buyers from the West and South than have been seen in this market at one time for many months. Their presence here so early in the season is a satisfactory indication that the country is in need of goods, and although we do not hear of any very large orders being placed, still enough is being done to relieve the market to a considerable extent of the dullness which has prevailed for many weeks. The changes during the week have been few, and the general tone of the market is strong. Regarding screws, nothing further has transpired.

In Foreign Hardware there is nothing of importance to note. We hear of considerable improvement in the volume of business, and a belief that if the heavy rains which have visited not only this section but a large portion of the interior, would give place to more reasonable weather, a good business in all branches of the trade would be done.

The demand for Nails cannot be reported better than the previous week; the condition of the market is unchanged, and we repeat our quotation of 10d. at \$3-25 per keg, in large or small lots, for standard brands. There are some brands of Nails in this market which are offered on the basis of \$3-15 for 10d.

The Stanley Rule and Level Company have issued a revised discount sheet under date of 2d instant. The changes, which are few, will be found among our New York wholesale prices, on page 51. The following circular accompanies the discount sheet:

OFFICE OF THE  
STANLEY RULE AND LEVEL COMPANY.  
NEW BRITAIN, CONN., AUG. 2, 1875.

GENTLEMEN: We present herewith our discount sheet of this date, and the changes contained therein may be easily noted.

We are able to report every line of goods represented in our catalogues, or on our discount sheets, as in a perfectly vigorous condition. Our aim having always been to make our goods celebrated for their practical merits, as well as for their external finish, they can all stand alone from birth; and none of them have to wear plasters made up of other manufacturers' labels, trade marks, or numbers. No dealer handling our goods will have to apologize to customers, or explain how near they come to being the genuine article.

In the single line, "Bailey's Patent Adjustable Planes"—manufactured solely by us, under the original patent—our sales for the six months ending July, 1875, exceeded those of the corresponding period in 1874 by more than 1000 Planes; and the aggregate sales are now over 100,000 Planes; with a present demand which suggests that mechanics regard them as a good tool to help them overcome the "hard times."

Dealers are not slow to perceive that the goods which mechanics seek are also those which will yield the earliest and surest returns to them.

Orders for our full assortment of tools will be promptly filled by us from our factories in New Britain, Conn., or from our warehouses, No. 35 Chambers street, New York.

Respectfully,  
STANLEY RULE & LEVEL CO.

The following circular explains itself:

THE EAGLE FILE WORKS,  
MIDDLETOWN, ORANGE COUNTY, N. Y.,  
July 27, 1875.

The firm of Wheeler, Clemson & Co. has been dissolved, Mr. E. F. Wheeler retiring. The remaining partners having purchased his interest, will conduct the business without other change.

They will pay all liabilities of the late firm, collect all outstanding debts, and will continue the manufacture and sale of the celebrated Wheeler, Madden & Clemson brand of Eagle Files (with the same superintendence and business management as during the last thirteen years), under the style of

THE MADDEN & COCKATNE FILE CO.  
Stephens & Co. quote their Boxwood Rules at discounts 70 and 10 per cent., and Ivory Rules 55 and 10 per cent. Willis Thrall & Son quote Boxwood and Ivory Rules at discounts 55 and 10 per cent., and 45 and 10 per cent. respectively.

The Nasor Manufacturing Co. have issued a circular under date of 1st instant, giving the following discounts from their price list of May last:

WROUGHT IRON PIPE.

On all Sizes, Plain and Galvanized, except ¾, 1 and 1 inch Plain.....45 %  
On ¾, 1 and 1 inch Plain.....40 %  
Subject to change without notice.

The Francis Axe Co., Buffalo, N. Y., have issued the following revised price list, under date of 2d inst.:

PRICE LIST.

Ridge BU Chopping Axes—Bronzed.

Light.....Stamped.....\$11-50 \$10-50  
Francis Stamped  
Axe Co. J. Russell

Medium.....11-50 10-50

Heavy.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

4½ to 5½.....11-50 10-50

Beveled Axes.	
Single Bit, 50 cents extra; Double Bitted, \$1 per dozen extra.	
Handled Axes.	
Francis Axe Co.'s Extra Handles (1 dozen cases).....	Net, \$14-50
J. Russell, No. 1, Ex. H'oles (1 doz. cases).....	12-75
Broad Axes, Steel Poll.	
Ship Carpenters' Axes.....	\$30-00
Western Pattern.....	32-00
Pennsylvania Pattern.....	32-00
New York Pattern.....	32-00
Ohio Pattern.....	32-00
Canada Pattern.....	32-00
Canada Pat. ern, 8 to 12.....	36-00
Less 35 per cent.	39-00

Boys' Axes and Hunters' Hatchets.

In 1 dozen Cases.

Boys' Axes, Beveled, 26 inch Handles.....\$18-50

Hunters' Hatchets, Beveled.....9-00

Less 35 per cent.

"George Washington" Hatchets.

In 1 dozen Cases.

Cast Steel Chiseling.....Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9

"all Polished.....\$8-50 \$8-50 \$8-50

Lathing.....5-00 8-50 9-00

Claw.....9-00 9-00 10-00

Solid Cast Steel Lathing, Pol'd.....11-00 12-00 13-00

Less 35 per cent.

Wide Bit Broad Hatchets.

In 1 dozen Cases.

Nos.....3 4 5 6 7 8 9

Width Bit. 5in. 5½in. 6in. 6½in. 7in. 7½in. 8in. 9in.

Price.....\$13-00 14-50 16-50 18-00 19-50 22-00 25-00

Less 35 per cent.

Axes.

In 1 dozen Cases.

Ship Carpenters'.....Per dozen.....\$25-00

House Carpenters'.....24-00

Railroad.....25-00

Flat Head or Light Railroad.....24-00

Less 35 per cent.

The Bailey Wringing Machine Co., No. 106

Chambers street, agents for the American Meat

and Vegetable Chopper, and Starrett's Domestic

Press, quote these goods at discount 25 per

cent. from the following list:

Choppers.—Family Sizes. List Prices.

No. 1, Small Family Size, 8 inch Cylinder.....\$6-00

No. 2, Large.....10.....9-00

No. 3, Hotel or Bakers' size, 13 inch Cylinder.....9-00

No. 3, Farmers' Sausage Cutter, 13 inch Cylin-  
der.....15-00

Choppers.—Butcher's Sizes.

No. 4, 15 inch Block, packed in single crates.....30-00

No. 5, 20.....30-00

No. 5, 30.....35-00

Starrett's Domestic Press.

No. 1, Size 7x 9, 4 inches Deep.....3-00

No. 2, "8x12, 5.....4-00

No. 3, "10x14, 6.....5-00

An extra discount of 5 per cent will be al-  
lowed on Family Choppers Nos. 1, 2, 3, and 3, and on Domestic Presses when ordered by the  
case, in the "original package." Choppers  
Nos. 1 and 2 are packed in cases of 6 each, Nos.  
2½ and 3 in cases of 4 each. Presses in cases  
of 6 each. Sample cases of Family Choppers,  
assorted sizes (3 No. 1's, 3 No. 2's, and 1 No. 3),  
subject to same discount (5 per cent.) as regular  
cases.

TERMS.—Time 60 days. Two per cent. dis-  
count if payment is made within 30 days.

It is only five years since these Meat Chop-  
pers were introduced, and we are informed that  
over 60,000 have been sold. The manufac-  
turers' claim for them that they will do more  
work, with less power, than any Meat Chopper  
on the market. The Silver & Deming Manu-  
facturing Company's Meat Stuffers, for which the  
Bailey Wringing Machine Company are also  
agents, are worthy the attention of the trade.  
The manufacturers have placed upon the mar-  
ket three new sizes. The following is the list  
price of these machines, which is subject to  
discount 20 per cent:

Silver's Patent Meat Stuffers.

No. 1—Small Family Size.....\$8-00

No. 2—Large Family Size.....15-00

No. 3—Small Butcher's Size.....18-00

No. 4—"The Butcher's Favorite".....25-00

Illustrations of the above-mentioned ma-  
chines will be found in advertisement on the  
10th page.

We print below the revised list of American  
Scissors and Shears; the discount remains as  
before, viz., 30 per cent., with an extra 5 per  
cent. when full cases are ordered.

AMERICAN SCISSORS AND SHEARS.

Nos.....2 3 4

Per gross (new list).....\$10-00 \$12-00 \$16-00 \$24-00 \$32-00

Per gross (old list).....\$14-00 \$18-00 \$24-00 \$36-00 \$48-00

The Standard Mfg. Co., successors to Hartje,  
Wiley & Co., Pittsburgh, Pa., have issued the  
following circular. Fernald & Sise, their  
agents in this city, have just received a full  
assortment of their Hollow Ware, which they  
quote as follows from Pittsburgh list:

Glue Pots and Covered goods, discount.....25 & 25 %

Maolin Kettles, Scotch and Yankee Bowls, 25 & 30 %

Having purchased the Foundry and Enamel-  
ing Works of Messrs. Hartje, Wiley & Co., we  
beg to inform the customers of the late firm  
that we have resumed work, and are now man-  
ufacturing the same class of goods as former-  
ly, and propose to add, about the 1st of Janu-  
ary, 1876, a full line of Tinned Cast Iron Hollow  
Ware.

We should be pleased to retain your trade, as-  
suring you that the well-earned reputation of  
H. W. & Co. for Enamelled Goods of the very  
best quality, will not only be fully maintained,  
but, if possible, improved by us.

Our works are the largest and most complete  
in this country for the specialty of Enamelled  
Ware, with every known facility for the eco-  
nomical production of first-class goods, so that  
dealers favoring us with their orders can rely  
on their prompt execution and quick shipment,  
as well as that the goods shall be unexcelled in  
point of quality and finish.

If convenient, when in the city, we would be  
pleased to have you call on us at the works.  
Very respectfully, yours,

STANDARD MANUFACTURING CO.

G. B. Walbridge & Co. will issue in a day or  
so an illustrated catalogue of the goods of their  
own manufacture and the specialties for which  
they are agents. Among the new goods we  
notice "Waite's Patent Concave Cutter Hollow  
Augers with Cast Steel Bits." These goods  
are sold by the standard list. The manufac-  
turers say of this tool: "The form of the head  
enables the operator to see the line to which  
he wishes to cut. The entire freedom from  
which the chips pass away without clogging,  
and the facility with which the knives  
can be ground, will, in use, be found  
entirely satisfactory." We notice in this book  
an excellent arrangement of the Tack list, the  
classification, we think, being more convenient  
for reference than the prevailing form. The  
book, which covers 90 pages, is neatly arranged,  
and will be accompanied by a discount sheet.  
They call attention to the manufacturing  
branch of their business, and are prepared to

make to order specialties in light machinery.  
They quote Jas. Woolworth's Axe, Pick, Sledge  
and other Handles, in full cases, at discount 20  
per cent., instead of 10 per cent., as formerly.

The Wiebusch & Hilger Hardware Co., agents  
for Wm. P. Kel







about, but it threatens to prove a serious national loss by its effects. The fact is the rain not only "rains every day," but descends in a steady down pour the livelong day. The French floods you are already familiar with, as well as their dire results. You may not so far be quite so well posted up as to what has just occurred in South Wales, Gloucestershire, Monmouthshire, and other parts of this country. In one pleasant little Welsh valley the torrents of rain came down so suddenly that the rivulet broke into new courses, reservoirs burst, and 17 persons were drowned, besides great destruction of stock and property being effected. A gentleman who returned from the locality yesterday tells me that a large river in the Forest of Dean rose 34 feet in a single night, and that the house in which he was then staying was surrounded by water for a period of three days, during which the inmates were, of course, in a state of siege. In Lincolnshire, Yorkshire, Derbyshire and the Southern counties the floods have not been so destructive in their direct results, but indirectly the matter is assuming most serious aspects. The hay crop has been, or is being, either badly washed away, or utterly spoiled by the drenching to which it is daily, nay, almost hourly, subjected. But it is as to the fate of the cereals that the most anxious solicitation is felt and expressed. The effects of a good harvest in this country are too well known by merchants and traders in every branch of business to be carelessly disregarded. An abundant and well gathered harvest satisfies the commercial community in the cities and towns, and gives them renewed confidence in the futures of their several enterprises. They are perfectly well aware that plenty of corn in our own rural districts means less imports from abroad with the consequent retention of money in the country. It means, also, that the farmers and the host of small country towns and villages are put into possession of immediate promise of plenty of cash, which they, as an almost invariable rule, either bank on deposit terms or expend in the purchase of new implements, articles of furniture, dress, etc. In this and a score of other indirect ways, the "to be or not to be" of the English harvest is to us a matter of much concern, and it does not create a more cheerful feeling in the iron trade to forebode a bad harvest with all its depressing influences. Should the rains be prolonged there can be no doubt, I think, that the corn crops here will shortly be irretrievably damaged, a fact which is of still more serious import when we bear in mind that the floods have been very widespread, and that the great range of the crops in Hungary, France, Bavaria, Prussia and along the banks and delta of the Danube.

## THE GERMAN IRON TRADE.

The *Allgemeine Zeitung* states that a counter petition, in opposition to one sent to the German Emperor in May by the manufacturers of Berg and Mark, praying for protective duties on iron and steel manufactures, has been got up, stating that customs duties are not needed for the protection of the trade in German iron and steel manufactures for retail, is being circulated amongst those interested, and has already received 1350 signatures. The two chief points in the petition are—that protective duties will enhance the cost of the raw material of which articles for retail are made, and thus tend to hamper the export trade in those goods; and that the adoption by Germany of protective duties on iron and steel manufactures in similar measures on the part of foreign iron producing countries, which would have the effect of shutting out the German goods from these markets. The petition urges further that diplomacy should exert itself to the utmost to induce foreign powers—notably France, Belgium, Austria and the United States—to adopt free trade principles, so far, at least, as Germany is concerned, and suggests that the effectual way to attain this end will be, not by imposing protective duties on iron goods, but by threatening to levy heavy import duties on the chief articles of export of the respective countries, as, for instance, in the case of Austria and France, on wine and articles of luxury.

## THE DIAMOND ROCK DRILL.

The Newcastle *Journal*, of recent date, gives the following account of the working of the diamond rock drill at a place near that town: "On Saturday last a number of gentlemen interested in lead mining, railway tunneling, and similar works, assembled at Sanhope to witness the working of this drill in Hope level, which is a gallery about seven feet high by six feet wide, being driven through very hard mountain limestone to reach the lead ore known to exist at a certain point. Already about half a mile has been perforated. The party proceeded in little tram wagons drawn by a horse. On leaving these, they found the machine had ceased working after drilling 14 holes, but by the perpendicular face which terminated the gallery and the frame-work which carried the drills when working had been lowered, so as to enable the workmen to shift the machine back till it should be beyond reach of danger from the effects of blasting. A 30 horse engine is employed outside the workings to condense air to a pressure of 40 lbs. per square inch, which is conducted along the level by cast iron pipes to within a short distance of the working face, and a flexible India rubber tube connects the pipe with an air engine, which raises and lowers the frame alluded to above, and gives a circular action to the drills, which when working are gradually advanced by a screw motion. The cutting is done by diamonds, which are set round the end of a steel drill, which is itself a hollow cylinder. The diamonds overlap the cylinder's edge sufficiently (both inside and out) to enable it to clear itself, and bring away a core of the material acted on—a very valuable consideration when the drill is used for boring for coal or other minerals, as an exact section of the strata can be registered with the cores. Although the machine had completed its allotted work, on the arrival of the visitors the air was turned on, and the frame screwed back to its bearings, and, being secured, a drill was adjusted for a new hole to exhibit the capabilities of the machine. Though all present were practically acquainted with mining operations, those who witnessed the action of the drill for the first time were greatly astonished, for a hole  $2\frac{1}{2}$  in. diameter was driven 6 inches into an exceedingly hard limestone in 1 minute and 35 seconds. The machine was then moved back to a place of safety, and four of the most central holes were charged with dynamite. After firing the charges it was found that the entire face of the rock to the depth of 3 feet 6 inches had been brought away so completely that nothing remained to restore an even face again but to remove the two little corners at the foot, in which were the only two holes remaining of the 14 originally drilled. Thus 8 unnecessary holes had been made, but as the machine works so quickly it is considered better to drill extra holes before removing the drill, rather than risk leaving a portion of the rock, which would have to be removed before the drill could be brought up to its work again. Those who know what it is to blast a solid face of rock, fast all around, will easily understand how satisfactorily dynamite did its business in this instance, and those present were as much surprised at this result as they were at the rapid

action of the drill itself. The level is thus being driven at 10 yards a week.

## THE SCOTCH PIG IRON MARKET.

The Glasgow warrant market has been quiet, prices having varied very little on either side of a medium of 60/3, for cash. This was the standing quotation on Tuesday morning, but it will suffice to show the tone of the market to state that in the afternoon a lot of 2000 tons was done at 59/9, fourteen days fixed. The shipping business has again been on a free scale, over 13,000 tons having been transferred in this way during the week. Friday and Monday, 16th and 19th, being holidays in Glasgow, and Saturday no market, next week's returns will not, in all probability, show to such advantage, and prices may have to be bolstered up in consequence. There are now 33,250 tons in Connal's stores. Teasdale's freight is not changed, nor does the price of ballast pig iron vary from 53/ per ton. Messrs. Berger, Spence & Co.'s circular of to-day remarks: "The temporary firmness in Scotch pig iron this week is mainly attributable to the fact of increased local speculation, entered upon by a few interested holders, with a view to uphold prices until the stocks accumulated in anticipation of the recent spurt have been in some degree worked off. In the face of decided weakness in the Middleborough district, this second attempt on the part of Glasgow merchants to keep up prices is very justly looked upon with suspicion; the conviction being in well informed circles that the firmness will be of but short duration."

Messrs. James Watson & Co. (Glasgow, July 15) say: "The Scotch pig iron market has been quiet since the 9th instant, the price of warrants varying from 60/6 to 60/3, cash, closing to-day buyers at 60/1½; sellers, 60/3. Shipments last week were 13,215 tons, against 9552 tons in the corresponding week of 1874. We quote as under:

G. M. B., at Glasgow	No. 1.	No. 2.
Gartsherrie	62/6	62/6
Coltness	62/6	62/6
Summerlee	62/6	62/6
Langloan	62/6	62/6
Carnbroe	62/6	62/6
Calder, at Port Dundas	62/6	62/6
Glenarnock, at Ardrossan	62/6	62/6
Eglington	62/6	62/6
Dalmellington	62/6	62/6
Kinnell, at Boness	62/6	62/6

Messrs. Wm. Colvin & Co. (Glasgow, July 20) report: "There has been very little business in our market during the past week on account of the holidays. On Wednesday and Thursday warrants continued inanimate, the price ranging from 60/6 to 60/3. To-day the market opened at 60/3, cash, and after a limited business closed steadily, 60/3 the nominal price. Prices of makers' iron remain unchanged as under:

G. M. B., at Glasgow	No. 1.	No. 2.
Gartsherrie	62/6	62/6
Coltness	62/6	62/6
Summerlee	62/6	62/6
Langloan	62/6	62/6
Carnbroe	62/6	62/6
Calder, at Port Dundas	62/6	62/6
Glenarnock, at Ardrossan	62/6	62/6
Eglington	62/6	62/6
Dalmellington	62/6	62/6
Carroll, at Grangemouth, selected	62/6	62/6
Shotts, at Leith	62/6	62/6
Kinnell, at Boness	62/6	62/6
Bar Iron	62/6	62/6
Nail Rods	62/6	62/6

Week ending July 17, 1875	Tons.
July 18, 1874	9,833
July 18, 1874	9,844

Decrease..... 111  
Total increase for 1875..... 76,006  
Messrs. John E. Swan & Bros. (Limited) prices current gives these figures:

Glasgow Brands	Furnaces	Out 40.	Out 10.	Prices.
Gartsherrie	13	3	16	64/ 62/ 63/6
Coltness	13	3	16	64/ 62/ 63/6
Summerlee	13	3	16	64/ 62/ 63/6
Langloan	13	3	16	64/ 62/ 63/6
Govan	13	3	16	64/ 62/ 63/6
Calder	13	3	16	64/ 62/ 63/6
Shotts (Ordinary)	5	2	7	52/ 50/ 51/6
Carnbroe	4	2	6	63/6 61/6 64/
Wishaw	2	1	3	63/6 61/6 64/
Monkland	9	0	9	61/6 60/6 60/
Chapelhall	6	0	6	61/6 60/6 60/
Clyde	6	0	6	61/6 60/6 60/
Quarter-Clyde	4	1	5	61/6 60/6 60/

\* 1. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 5-5 No. 3, g. m. b., 60/3.	WEST COAST BRANDS—f. o. b. Ardrossan.
Glenarnock	7 2 9 68/ 62/ 63/
Ardeer	4 1 5 68/ 62/ 63/
Eglington	6 2 8 68/ 62/ 63/
Kinnell	3 2 5 68/ 62/ 63/
Portland	3 2 5 68/ 62/ 63/
Dalmellington	6 2 8 61/ 59/ 59/

Glengarnock.....	7	2	9	68/	62/	63/
Ardeer.....	4	1	5			
Eglinton.....	6	2	8			

Lugar.....	Brand' Eglnt'	4	0	4	62/	60/	61/
Muirkirk....		3	0	3			
Portland.....		3	3	6			
Dalmellington.....		6	2	8			

TRADES OF SHEFFIELD.
Since I last wrote a meeting of the committee of the share holders of the Phoenix Bessemer Steel Company (Limited)—which suspended payment with £140,000 liabilities beside £280,000 paid up share capital in June—has been held. The committee had thoroughly investigated the statement of the stock, plant, &c., in order to ascertain the precise position of the company in reference to the proposed payment of a composition of 12/ in the pound. It was thought that to do this the remaining £10 per share must be called up. A circular was consequently issued to all the shareholders on Wednesday, calling a meeting on Thursday, and stating that the negotiations between the committee and the creditors' committee have resulted in the latter deciding to recommend the acceptance by the creditors of 12/ in the pound payable by instalments. If this arrangement be sanctioned by the meeting, a scheme either for the reconstruction or resuscitation of the company will be put forward.

It cannot be said that the reduced values of pig and finished iron in Shropshire, Staffordshire, and elsewhere, have had a very appreciable effect here, there being at present no indication of any intention on the part of the local producers to lower prices. Indeed, as a strict matter of fact, merchant firms have been correspondingly lower since Whitsuntide than in several other localities, so that the present drop elsewhere having already been discounted locally, no further alteration may take place at present. At the same time it is very clear that

until quotations do come down no revival of activity can be looked forward to in the finished iron branches. Whether, with fuel and wages at their present level, the iron masters can afford to submit lower rates, is a question for their decision. They say they cannot, and give excellent reasons in support of their flat.

A few sales of foundry, forge and hematite pigs have taken place during the week, mostly at prices within a shilling or two of last week's figures. Maryport hematite, No. 3, is now 80/; No. 5, mottled and white, 80/; Bessemer, No. 1, 85/; No. 2, 82/6; and No. 3, 82/6, all per ton, less the usual allowance for prompt cash. Millon Bessemer is, No. 1, 83/4; No. 2, 80/; No. 3, 77/6; ordinary, No. 3, 85/; No. 4, 84/; No. 5, 90/; mottled, 85/; and white, 82/6 per ton, on four months' terms. Most of the blast furnaces in the immediate vicinity are kept blowing, and, as a consequence, there are good stocks of pigs at some establishments. Ores from North Lincolnshire continue to be largely used in South Yorkshire, and are likely to be so in a further degree as the development of each district progresses. At and near Frodingham new fields are being opened up and worked, the ores being sent here by wagons, which are fully utilized in conveying coal and coke as back loads. The distance is not very great between some of the Yorkshire iron works and North Lincolnshire; hence it is by no means surprising to find that an increasing interest is being manifested in the latter by the iron masters of the former, and that they have already a large pecuniary stake in the result.

The steel rail trade is in part active and in part excessively dull. A few houses are working off contracts entered into some time ago at figures which, certainly, keep the machinery going, but do not yield more than the merest margin of profit. Other concerns are in the market at even barer figures for such current orders as can be secured, while one or two firms, of great capabilities and high standing, find that it pays them best to stand aloof from active visible competition, relying only upon such specifications as reach them from time to time from their old connections in various parts of the world. I hear of one or two instances of the latter kind in which fairly good, but not unwieldy, orders for cast steel colonies are being worked off. These parcels are commonly sent by water to London and thence by direct consignment to their destination. Boiler plates are in steady request, those of good reputed make being quoted £12 to £13 per ton. Ship plates (iron) are selling fairly well, but, as was hinted at Cammell & Co.'s meeting last week, steel ones are beginning to be used for several reasons—their lighter weight, their greater strength and lower cost. Whether these advantages will eventually prove reliable is the moot point with some whose views incline to the claims of the steel on the ground of its inferior ductility. It is—let this be as it may, however—an undoubted fact that great organic changes are slowly spreading in the steel trade, both in respect of Bessemer and cast; Bessemer, from its cheapness, has lately to an appreciable extent superseded the commoner kinds of cast steel, and is also being substituted for iron in certain appliances. Cast steel, on the other hand, of a good quality is being put to a greater variety of uses than previously, owing to the number of mechanical or constructive appliances in which lightness as well as great strength is desired. This is the case in bridge building, steel chains now being used instead of iron, as formerly, for suspension purposes. The latest new bridge of this class over the Thames is a case in point. Steel wire is also being much extended in its variety of applications.

The condition of the industries not especially mentioned above is quiet, and does not appear to call for special remark here. Several colliery disputes exist in the district, but as their effect upon business is infinitesimal, they need not be referred to in detail. Fuel is quiet, both in demand and price. Final time is in few cases being worked, the men being quite willing to play two or three days weekly, provided their wages are not lowered and no ominous stacks of coal grow on the pit banks. There was a considerable falling off in the tonnage of coal taken to London by rail in June, as compared with May, the totals being respectively 326,178, and 366,106 tons.

I cannot find that there is any particular alteration in the general condition of the cutlery branches since I last had occasion to allude to them in detail. Many of the manufacturers of table cutlery are pretty well engaged, but those chiefly engaged on full time are the few firms who have gone more largely into the use of modern machinery than their competitors, and are thus enabled to cut prices a little finer. The home trade is quiet; but France continues to buy razors and fine cutlery on a tolerably good scale, and, what is more, always pays regularly. It has been a matter for great surprise amongst our manufacturers that, even directly after the war, hardly any French customer was found amongst their payments fell due. The Spanish branch, the Levant, India and Australasia are all taking moderately large lots of common table knives and forks, razors, and pocket cutlery. The United States are still very indifferent customers, although Canada and other of the possessions in North America are again purchasing freely.

## BIRMINGHAM AND STAFFORDSHIRE.

The iron trade of the town and district named is still very dull, and there is no appearance whatever of any imminent change for the better. The late reduction in prices has not, so far, had the effect of causing any material influx of orders for finished iron. Since I wrote my last week's letter, the New British Iron Company have withdrawn their isolated quotation of £11 for bars, and now stand on an equality with their competitors. The sheet makers firmly hold out, only two houses, Messrs. Baldwin and Messrs. Thompson, Hutton & Co. (Wolverhampton) having reduced their flat B sheets last week. Corrugated sheets are also firm; the solitary departure from the general rule being, in the case of Davies Brothers (of Stourport), who have lowered their flat B sheets £1 per ton, and flat annealed 10/ per ton. Common iron is, of course, purely nominal, unmarked bars being as low as 23/ per ton, and common sheets 21/ 5/ to 21/ 15/. The merchants and miscellaneous buyers are, however, out of the market in a very considerable degree, so that no amount of new business worth mentioning is being transacted.

## SOUTH WALES.

A gloomy feeling prevails in South Wales, owing to the commercial rumors which are in circulation. Names are freely mentioned, but there appears to be some probability that the parties in question will be able to pull through. The coal trade of the vicinity is being carried on at a loss, or at any rate without attendant profit, so that it is by no means surprising to hear the tidings that many of the pits are to be stopped until prices shall go up. The iron works are anything but active; but still there is a gradual settling down into position, which has a much better appearance than the late dismal look-out. A large Russian order for rails is known to be about to be placed in the market, and it is surmised that either Dowlais or Ebbw Vale will secure it, the former establishment having long had a good connection with the Muscovite Empire. The tin plate works are said to be a trifle better engaged. Ordinary rails, it may be said, are quoted 26/ 10/ to 27/ per ton.

## THE METAL MARKETS.

Metals have been inactive and dull during the

week. Copper is weak, and lower prices are expected to be declared almost immediately. On Tuesday 75 tons of Chili bars changed hands at £80 to £80, 10/; Wallaroo being £80. On the same day Straits tin was £79, 10/; spot, and 50 tons August-September, £78; 15 tons of Australia were sold at £75, cash. On Wednesday, Straits, spot, £78, 10/; next month, £78; 10 tons Australian, £75; at which price buyers were willing to go on had sellers been disposed to close with offers. Little business has been done in spelter or lead. Messrs. Von Dadelzen & North say: "Copper continues very dull, with very little business doing. If Chili bars were pressed for sale lower prices would immediately ensue. The nominal value is £50. Austral in equally dull. Holders of Wallaroo more inclined to give way, and want offers. Nominal value, £80; Burma about £86, 10/ to £87. English, none offered. Tin has continued to decline, and the downward movement made a further progress of £2 per ton, Straits being now £78 to £78, 10/ on the spot and forward; and Australian, £75 to £75, 10/. Banca, in Holland, 50 fl., and Billiton, 47½ fl. English quite nominal, but a serious fall is imminent. Tin plates remain dull at last week's quotations; if anything, lower prices are expected. Lead maintains its value at about £22. Spelter remains inactive; hardly any business reported. Common Silesian, £24 to £24, 5/; here; for special brands in outports, 5/ to 10/ extra asked. Quicksilver has declined to £10, 10/ per bottle."

Messrs. Vivian, Bond & Watson report: "Copper.—The market for the past fortnight shows a decline of about 20/ per ton, the business throughout having been of a most retail description. Sales have been reported as low as £80 per ton, but no copper is now available under an advance of 10/ to 20/ per ton on this price. In furnace material the only business reported is the 835 tons ore sold at the Swansea sale, 13th inst.; average produce, 21 11-16 per cent.; average price, 16/ per unit. Cape ore, average, 31 11-16 per cent., bringing an average of 16/3 per unit. The charters for last half of June were advised 8th inst. as 1350 tons fine ore and regulus, and 1900 in bars for England and 750 tons bars for France; total, 4000 tons fine copper. Tin has declined a further 4/ to 5/ per cwt., Straits having been sold at 78/ cash, and 77/6 for forward delivery, and Australian at 75/ to 76/; Peruvian neglected."

The *Mining Journal* remarks: "Copper.—The market for this metal has been very much restricted during the week, and every description of copper has been dull of sale. Chili bars have hardly altered at all in value, the quotation throughout the week being £80 to £81 for g. o. b., usual cash terms, £79, 10/ three months prompt fixed. Tough copper is quoted £86; best select, £87; and 4 by 4 sheets, £91 to £92; yellow metal, 7½ to 8½. Lead.—The market has been firm throughout the week, and business has been reported in good soft English pig at £22 to £22, 5/; soft Spanish, without silver, is still quoted at £31, 10/. Spelter.—Ordinary Silesian has been dealt in at £23, 15/; No. 1 at £24, 15/; No. 2 at £23, 15/; No. 3 at £23, 15/; No. 4 at £23, 15/; No. 5 at £23, 15/; No. 6 at £23, 15/; No. 7 at £23, 15/; No. 8 at £23, 15/; No. 9 at £23, 15/; No. 10 at £23, 15/; No. 11 at £23, 15/; No. 12 at £23, 15/; No. 13 at £23, 15/; No. 14 at £23, 15/; No. 15 at £23, 15/; No. 16 at £23, 15/; No. 17 at £23, 15/; No. 18 at £23, 15/; No. 19 at £23, 15/; No. 20 at £23, 15/; No. 21 at £23, 15/; No. 22 at £23, 15/; No. 23 at £23, 15/; No. 24 at £23, 15/; No. 25 at £23, 15/; No. 26 at £23, 15/; No. 27 at £23, 15/; No. 28 at £23, 15/; No. 29 at £23, 15/; No. 30 at £23, 15/; No. 31 at £23, 15/; No. 32 at £23, 15/; No. 33 at £23, 15/; No. 34 at £23, 15/; No. 35 at £23, 15/; No. 36 at £23, 15/; No. 37 at £23, 15/; No. 38 at £23, 15/; No. 39 at £23, 15/; No. 40 at £23, 15/; No. 41 at £23, 15/; No. 42 at £23, 15/; No. 43 at £23, 15/; No. 44 at £23, 15/; No. 45 at £23, 15/; No. 46 at £23, 15/; No. 47 at £23, 15/; No. 48 at £23, 15/; No. 49 at £23, 15/; No. 50 at £23, 15/; No. 51 at £23, 15/; No. 52 at £23, 15/; No. 53 at £23, 15/; No. 54 at £23, 15/; No. 55 at £23, 15/; No. 56 at £23, 15/; No. 57 at £23, 15/; No. 58 at £23, 15/; No. 59 at £23, 15/; No. 60 at £23, 15/; No. 61 at £23, 15/; No. 62 at £23, 15/; No. 63 at £23, 15/; No. 64 at £23, 15/; No. 65 at £23, 15/; No. 66 at £23, 15/; No. 67 at £23, 15/; No. 68 at £23, 15/; No. 69 at £23, 15/; No. 70 at £23, 15/; No. 71 at £23, 15/; No. 72 at £23, 15/; No. 73 at £23, 15/; No. 74 at £23, 15/; No. 75 at £23, 15/; No. 76 at £23, 15/; No. 77 at £23, 15/; No. 78 at £23, 15/; No. 79 at £23, 15/; No. 80 at £23, 15/; No. 81 at £23, 15/; No. 82 at £23, 15/; No. 83 at £23, 15/; No. 84 at £23, 15/; No. 85 at £23, 15/; No. 86 at £23, 15/; No. 87 at £23, 15/; No. 88 at £23, 15/; No. 89 at £23, 15/; No. 90 at £23, 15/; No. 91 at £23, 15/; No. 92 at £23, 15/; No. 93 at £23, 15/; No. 94 at £23, 15/; No. 95 at £23, 15/; No. 96 at £23, 15/; No. 97 at £23, 15/; No. 98 at £23, 15/; No. 99 at £23, 15/; No. 100 at £23, 15/; No. 101 at £23, 15/; No. 102 at £23, 15/; No. 103 at £23, 15/; No. 104 at £23, 15/; No. 105 at £23, 15/; No. 106 at £23, 15/; No. 107 at £23, 15/; No. 108 at £23, 15/; No. 109 at £23, 15/; No. 110 at £23, 15/; No. 111 at £23, 15/; No. 112 at £23, 15/; No. 113 at £23, 15/; No. 114 at £23, 15/; No. 115 at £23, 15/; No. 116 at £23, 15/; No. 117 at £23, 15/; No. 118 at £23, 15/; No. 119 at £23, 15/; No. 120 at £23, 15/; No. 121 at £23, 15/; No. 122 at £23, 15/; No. 123 at £23, 15/; No. 124 at £23, 15/; No. 125 at £23, 15/; No. 126 at £23, 15/; No. 127 at £23, 15/; No. 128 at £23, 15/; No. 129 at £23, 15/; No. 130 at £23, 15/; No. 131 at £23, 15/; No. 132 at £23, 15/; No. 133 at £23, 15/; No. 134 at £23, 15/; No. 135 at £23, 15/; No. 136 at £23, 15/; No. 137 at £23, 15/; No. 138 at £23, 15/; No. 139 at £23, 15/; No. 140 at £23, 15/; No. 141 at £23, 15/; No. 142 at £23, 15/; No. 143 at £23, 15/; No. 144 at £23, 15/; No. 145 at £23, 15/; No. 146 at £23, 15/; No. 147 at £23, 15/; No. 148 at £23, 15/; No. 149 at £23, 15/; No. 150 at £23, 15/; No. 151 at £23, 15/; No. 152 at £23, 15/; No. 153 at £23, 15/; No. 154 at £23, 15/; No. 155 at £23, 15/; No. 156 at £23, 15/; No. 157 at £23, 15/; No. 158 at £23, 15/; No. 159 at £23, 15/; No. 160 at £23, 15/; No. 161 at £23, 15/; No. 162 at £23, 15/; No. 163 at £23, 15/; No. 164 at £23, 15/; No. 165 at £23, 15/; No. 166 at £23, 15/; No. 167 at £23, 15/; No. 168 at £23, 15/; No. 169 at £23, 15/; No. 170 at £23, 15/; No. 171 at £23, 15/; No. 172 at £23, 15/; No. 173 at £23, 15/; No. 174 at £23, 15/; No. 175 at £23, 15/; No. 176 at £23, 15/; No. 177 at £23, 15/; No. 178 at £23, 15/; No. 179 at £23, 15/; No. 180 at £23, 15/; No. 181 at £23, 15/; No. 182 at £23, 15/; No. 183 at £23, 15/; No. 184 at £23, 15/; No. 185 at £23, 15/; No. 186 at £23, 15/; No. 187 at £23, 15/; No. 188 at £23, 15/; No. 189 at £23, 15/; No. 190 at £23, 15/; No. 191 at £23, 15/; No. 192 at £23, 15/; No. 193 at £23, 15/; No. 194 at £23, 15/; No. 195 at £23, 15/; No. 196 at £23, 15/; No. 197 at £23, 15/; No. 198 at £23, 15/; No. 199 at £23, 15/; No. 200 at £23, 15/; No. 201 at £23, 15/; No. 202 at £23, 15/; No. 203 at £23, 15/; No. 204 at £23, 15/; No. 205 at £23, 15/; No. 206 at £23, 15/; No. 207 at £23, 15/; No. 208 at £23, 15/; No. 209 at £23, 15/; No. 210 at £23, 15/; No. 211 at £23, 15/; No. 212 at £23, 15/; No. 213 at £23, 15/; No. 214 at £23, 15/; No. 215 at £23, 15/; No. 216 at £23, 15/; No. 217 at £23, 15/; No. 218 at £23, 15/; No. 219 at £23, 15/; No. 220 at £23, 15/; No. 221 at £23, 15/; No. 222 at £23, 15/; No. 223 at £23, 15/; No. 224 at £23, 15/; No. 225 at £23, 15/; No. 226 at £23, 15/; No. 227 at £23, 15/; No. 228 at £23, 15/; No. 229 at £23, 15/; No. 230 at £23, 15/; No. 231 at £23, 15/; No. 232 at £2



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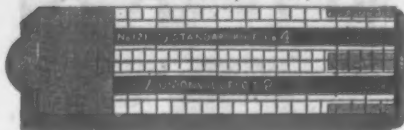




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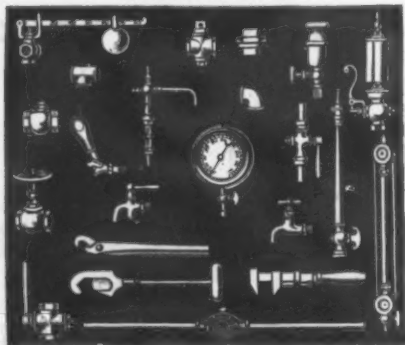
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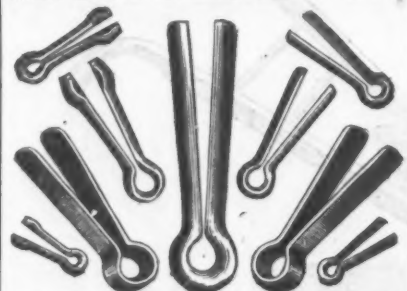
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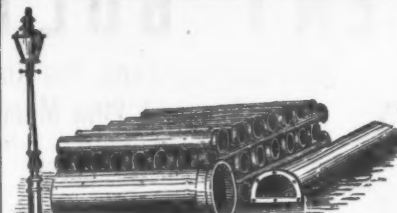
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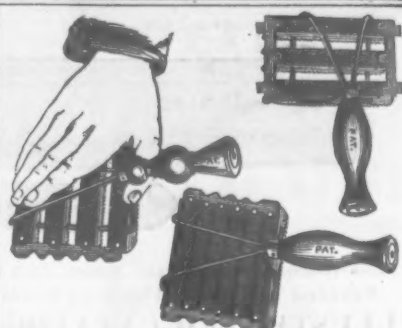
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## Wang Ching Yung Iron.

Some time since England sent explorers to ascertain the amount and quality of coal and iron in China. Instructors, mechanics and laborers sent to work the mills and foundries the Chinese government established in connection with its arsenals and dock yards, were instructed to furnish whatever knowledge they could gain. Their imperfect reports have warranted a belief that China is rich in coal and iron, and probably in copper. It is known that there labor is quick to learn and skillful in imitating, and that it is as cheap as the rice on which it subsists and can be procured in any quantity at from two to ten cents a day, without board or any extra compensation.

The investigation made in China, coupled with some inferences drawn by the Chinese of the profits on those iron manufactures they have procured from England led the Imperial government recently to send Wang Ching Yung to England to examine the machinery used in collieries, and gain information that will enable those in China to be freed from water and profitably worked, and new ones to be economically opened. He is also charged to learn the cheapest method of fabrication and transportation, and has visited the Yorkshire district, and is making a critical and complete exploration.

This action probably introduces China into the number of iron and coal-producing nations. Hitherto, rich as the empire is in these articles, and excellent as her artisans have been in the manufacture of some forms of cutlery, and in some small articles like nails and hinges, the primitive manual-labor method of mining the vast deposits of Chi-li and Shen-si—that is by drying in cakes after having been desulphurized by pounding in water—has operated against the working of the iron mines, and left the importation of iron, chiefly in bars, rods and hoops and the perfect article, one of the foremost offsets to that enormous export of silk and tea that has absorbed so much gold and silver in return.

Now, provided with coal and iron and cheaper labor than England can ever hope for, if the empire that in so short a period has learned to construct iron ships and machinery and to cast cannon, chooses to manufacture iron, what warrant is there that it will not export rails even to India and locomotives to Australia and raise another cloud over the Black Country? Australia has, indeed, entered upon the manufacture of iron, and India has the natural ability to do so; but China has superabundant labor, and her determined protection of domestic industry by risking war to prevent the importation of opium that hurts it, indicates the extreme she might venture upon when that would so greatly swell the revenues by funding remunerative employment.—*Phila. North American.*

## Science.

Mark Twain, in the August *Atlantic*, mourns over the diminished length of the Mississippi in this strain:

Therefore, the Mississippi, between Cairo and New Orleans, was twelve hundred and fifteen miles long one hundred and seventy-six years ago. It was eleven hundred and eighty after the cut-off of 1773. It was one thousand and forty after the American Bend cut-off (some sixteen or seventeen years ago). It has lost sixty-seven miles since. Consequently, its length is only nine hundred and seventy-three miles at present.

Now, if I wanted to be one of those ponderous scientific people, and "let on" to prove what had occurred in the remote past by what had occurred in a given time in the recent past, or what will occur in the far future by what has occurred in late years, what an opportunity is here! Geology never had such a chance, nor such exact data to argue from! Nor "development of species," either! Glacial epochs are great things, but they are vague—vague. Please observe:

In the space of one hundred and seventy-six years the Lower Mississippi has shortened itself two hundred and forty-two miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the Old Oolitic Silurian Period, just a million years ago next November, the Lower Mississippi River was upward of one million three hundred thousand miles long, and stuck out over the Gulf of Mexico like a fishing rod. And by the same token, any person can see that seven hundred and forty-two years from now the Lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact.

**Preparation of Ebonite.**—The use of ebonite, one of the newer preparations of India rubber is constantly increasing, on account of its better applicability to many purposes in the arts than its near ally, vulcanite. The two substances are quite similar, being composed of India rubber and sulphur, with some preparation of gutta percha, shellac, asphalt, graphite, etc., although these latter are not essential. In vulcanite the amount of sulphur does not exceed 20 to 30 per cent., whereas in ebonite the percentage of sulphur may reach as high as 60. An increased temperature is also required for this preparation. The approved formula consists in mixing together 100 parts of rubber, 45 of sulphur, and 10 of gutta percha, with sufficient heat to facilitate the combination. In manufacture, a sufficient quantity of this mixture is placed in a mold of a desired shape, and of such material as will not be affected by the sulphur contained in the mass. It is then exposed to the heat of about 315°, and a pressure of about 12 pounds to the square inch, for two hours. This is done most readily by placing the mold in a steam pan, where the requisite pressure and temperature can be easily kept up. When cold the ebonite is removed from the mold, finished and polished in the usual manner.



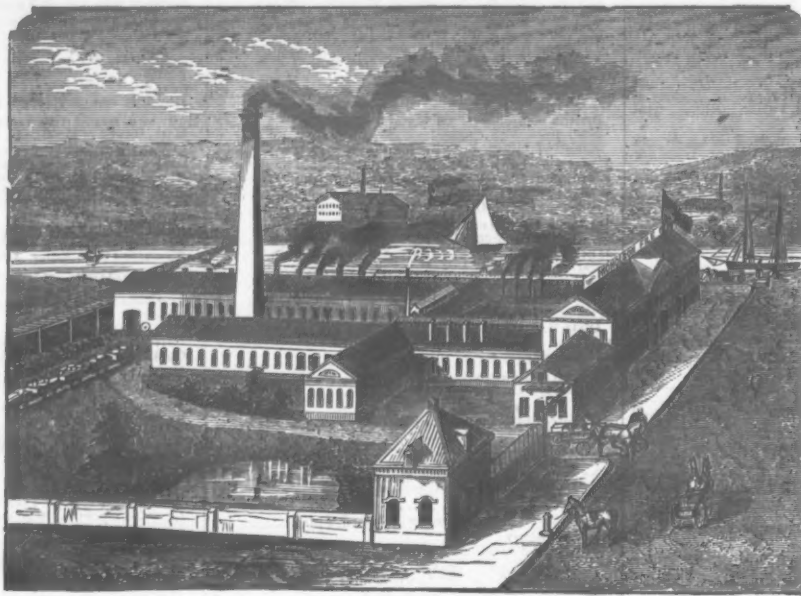
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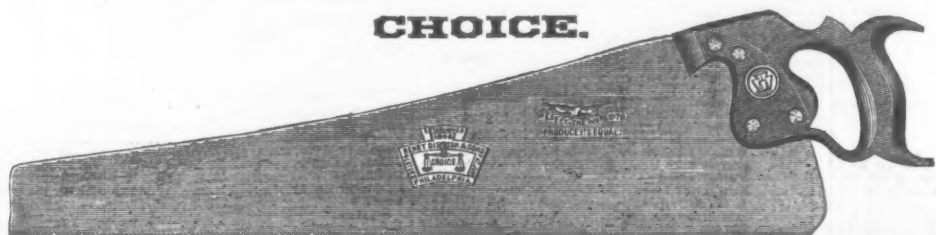
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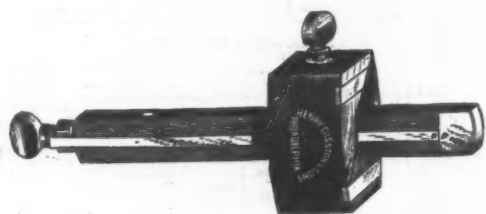


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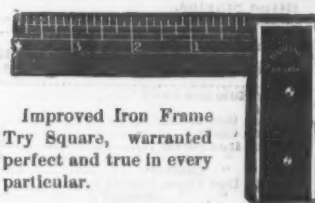
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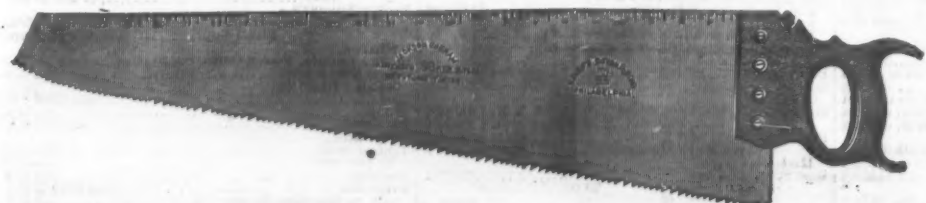


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# New York Wholesale Prices, August 4, 1875.

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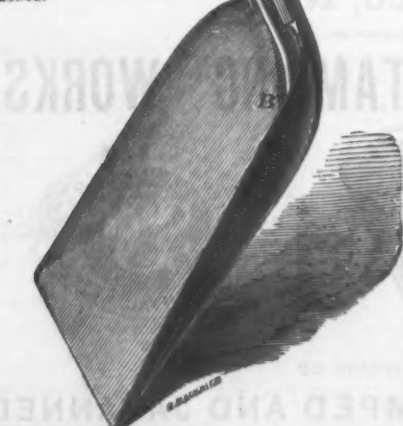


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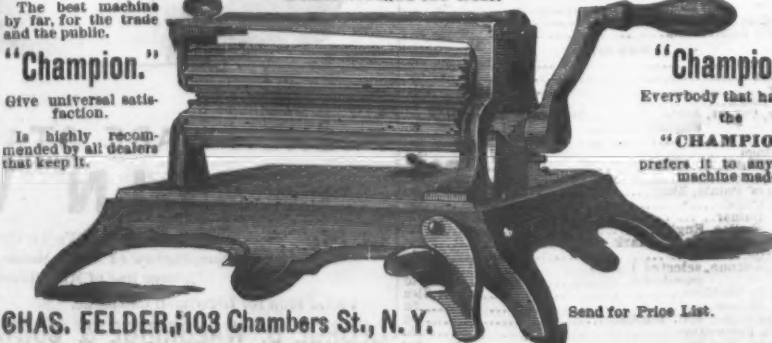
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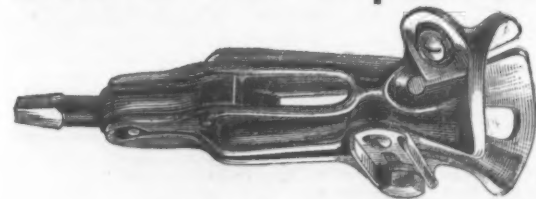


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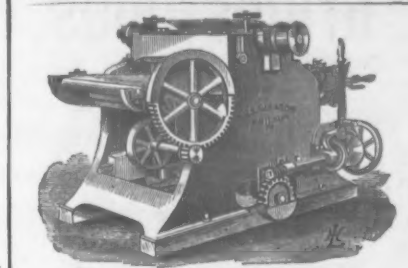
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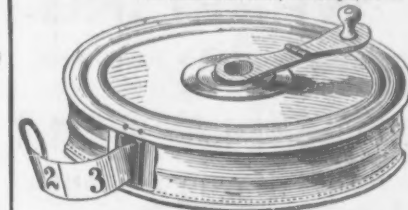
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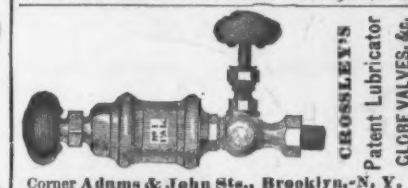
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**Drop  
PRESSES**

**Bennett Hotchkiss and  
N. C. Stiles' Patent.**

This Drop (which has been illustrated in this journal of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:  
First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place to a great extent, of all other kind of forges. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.  
Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps attached under the rolls, so arranged that as the hammer descends they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.  
Third.—The belt or board is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain any height of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow off on high than the collar is set for is required, work the hand lever, which will give you any height of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired height, so that the next blow can be given from a state of rest, of less height than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less height than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.  
The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

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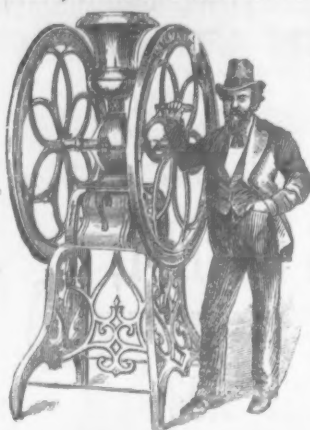




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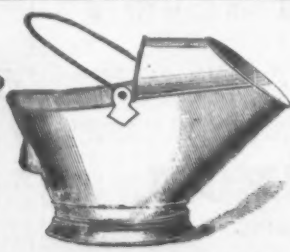
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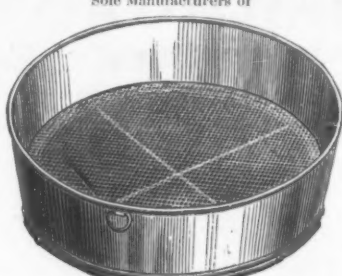
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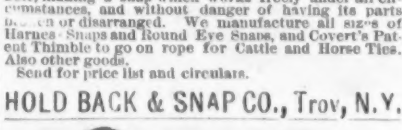
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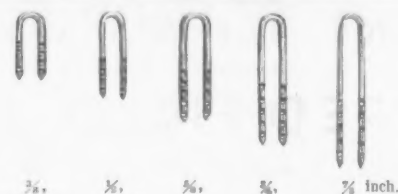
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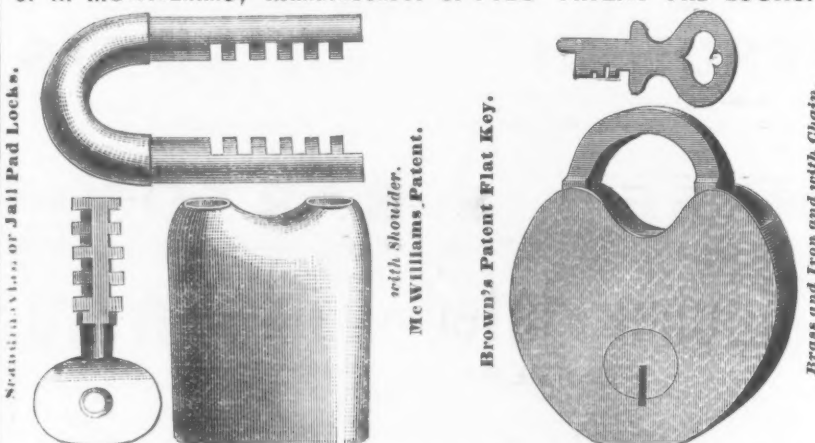
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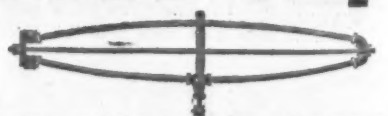
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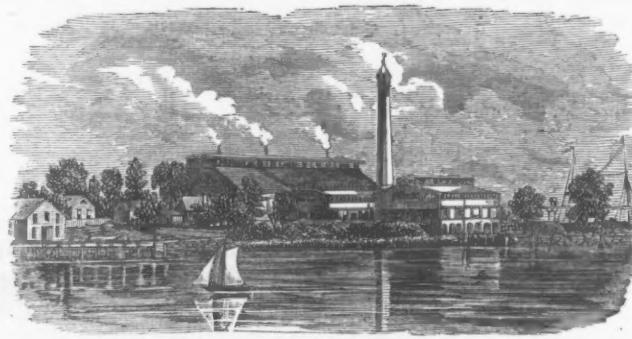
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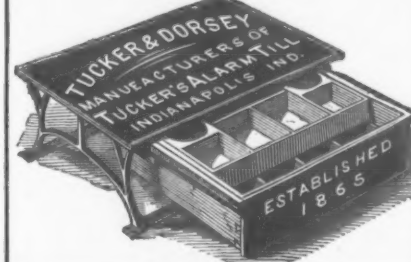
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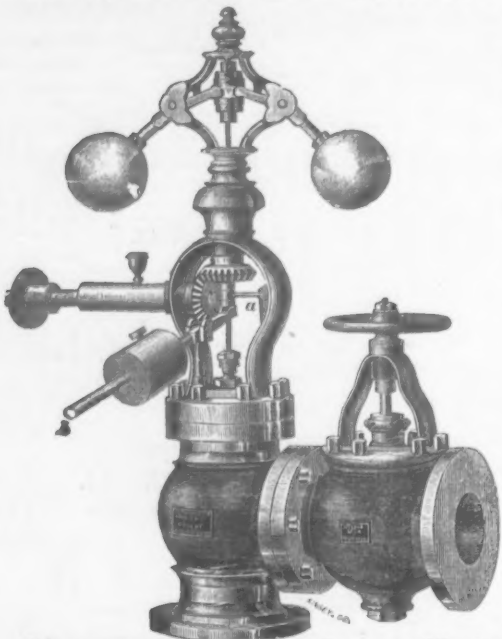
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Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
1	18-00	20-00	17-00	..	..
1 1/2	20-00	22-00	19-00	..	..
2	24-00	27-00	23-00	3-00	5-25
2 1/2	28-00	32-00	27-00	3-25	6-50
3	34-00	38-00	31-00	4-50	8-50
3 1/2	41-00	46-00	38-00	5-75	11-50
4	47-00	54-00	44-00	6-25	16-00
4 1/2	50-00	57-00	47-00	8-50	17-00
5	55-00	62-00	52-00	9-75	19-00
5 1/2	62-00	70-00	60-00	10-25	22-00
6	71-00	80-00	68-00	11-50	27-00
6 1/2	81-00	92-00	78-00	13-00	32-00
7	91-00	103-00	88-00	15-00	37-00
7 1/2	102-00	114-00	99-00	16-00	42-00
8	116-00	129-00	113-00	18-00	48-00
8 1/2	134-00	148-00	131-00	20-00	55-00
9	160-00	176-00	157-00	22-00	69-00
9 1/2	199-00	219-00	196-00	24-00	83-00
10	230-00	255-00	227-00	26-00	..

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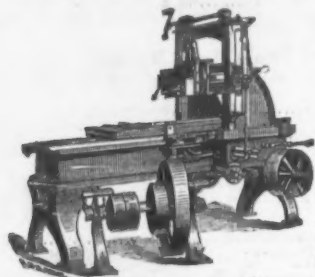
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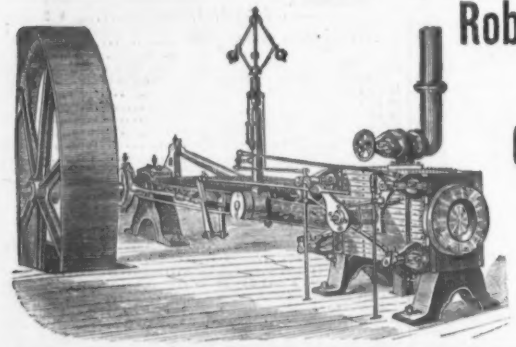
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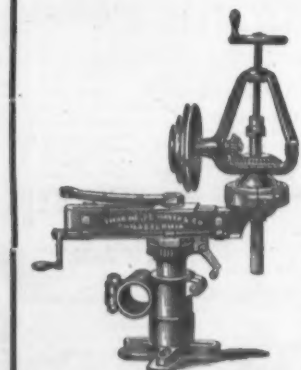
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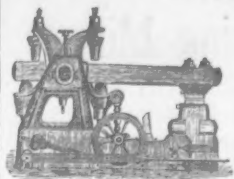
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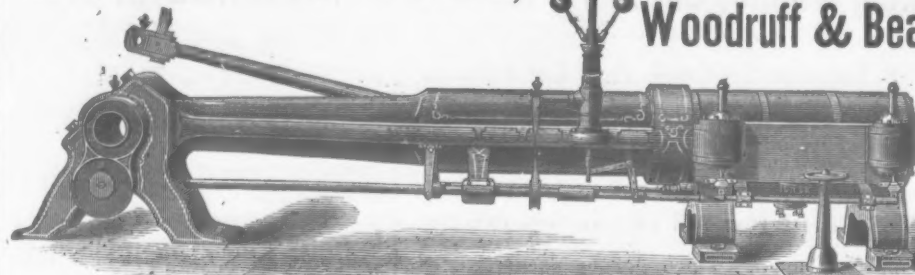
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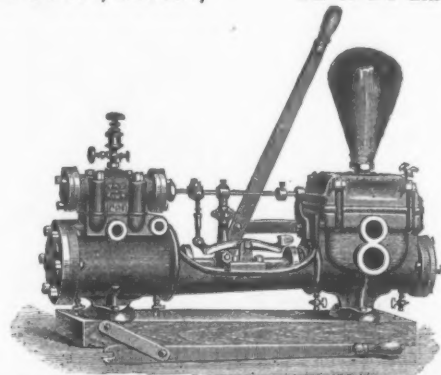
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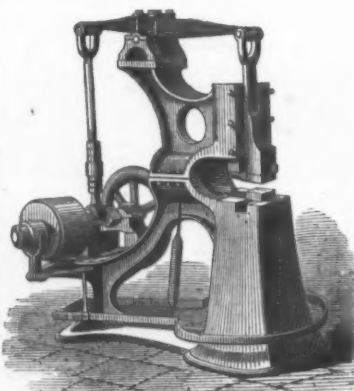
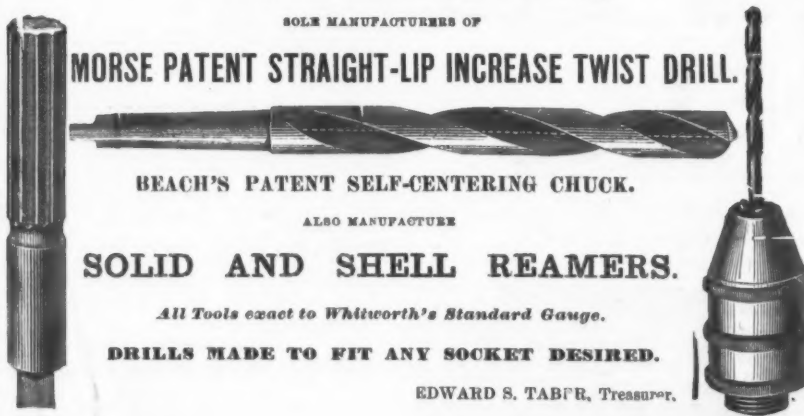
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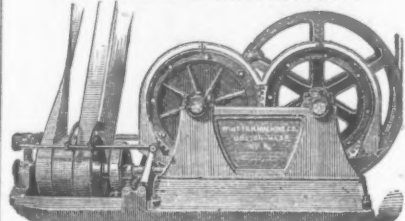
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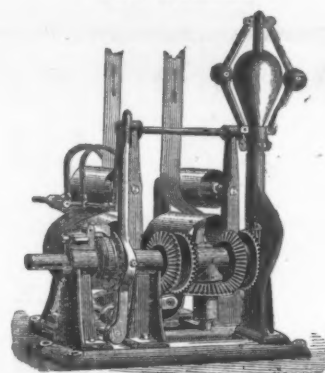
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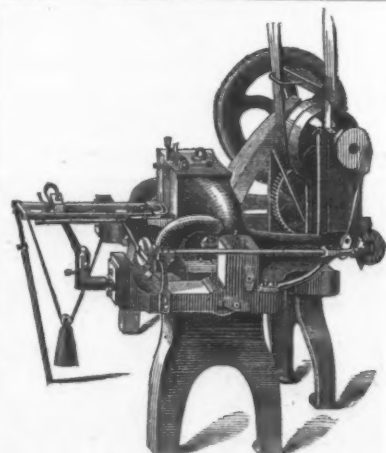
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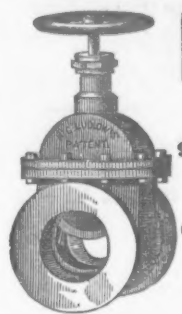
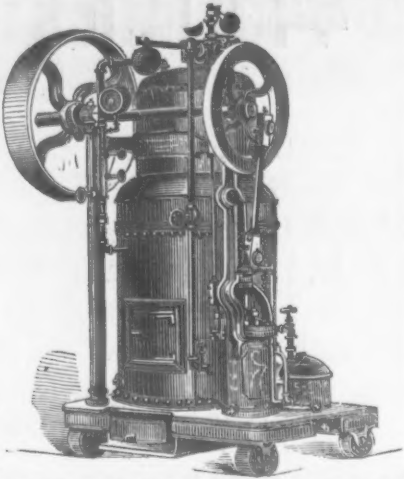
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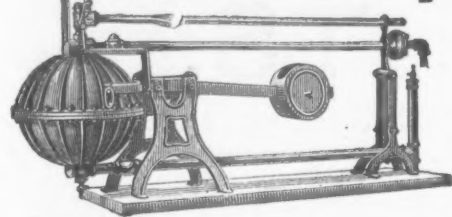
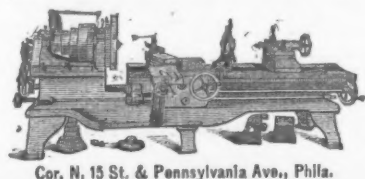
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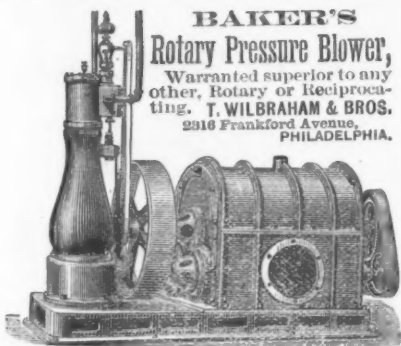
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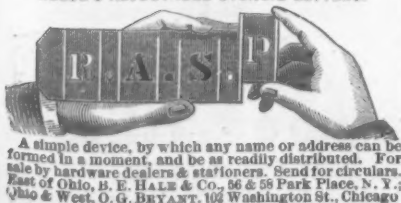
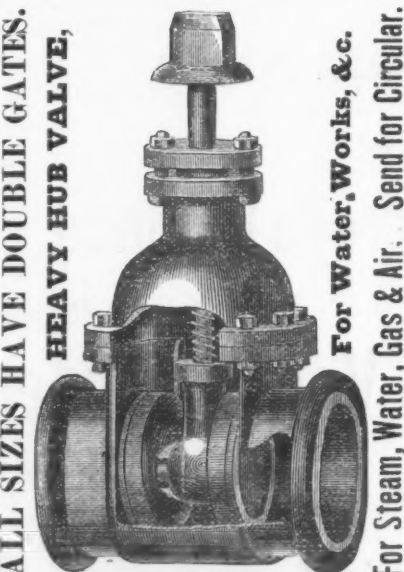
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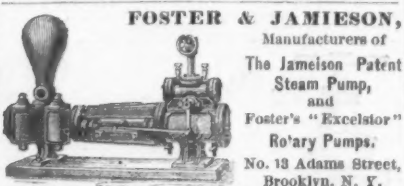
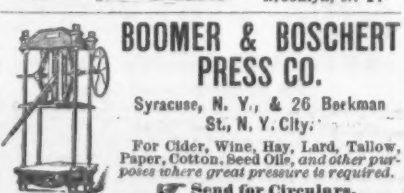
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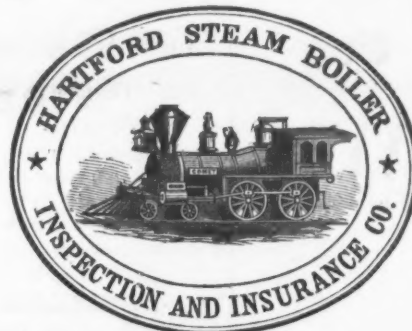
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GEO. CHROMPTON, Crompton Loom Works, Worcester

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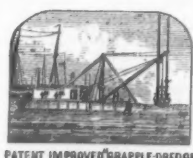
C. W. FREELAND, Treas. Dwight Manufacturing Co.,

Boston.

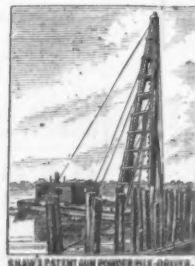
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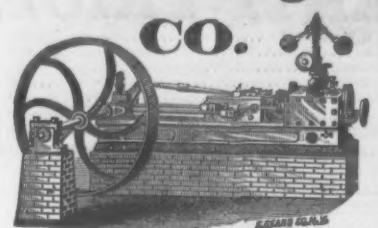
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Send for Circular and Price List.UTICA STEAM ENGINE CO.,  
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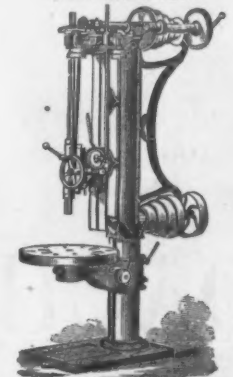
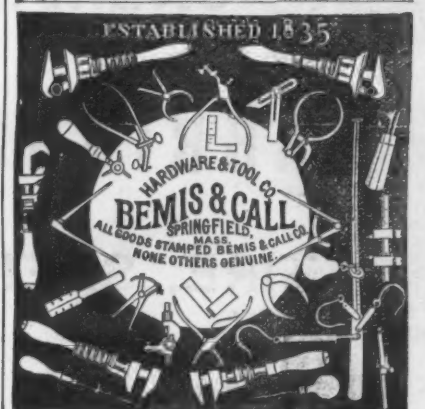
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LATHE CHUCK.We invite attention  
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Its working parts are  
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strong, compact and  
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XXX Genuine.....	40c	G.....	80c
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Note.—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

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MADE EXCLUSIVELY FROM SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.  
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RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS, ROLLED AND SLIT FROM SUPERIOR BRANDS.

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Great Reduction in Time and Labor to the Farmer by using



**Nellis' Original HARPOON HORSE HAY FORK.**  
Grapple and Pulley; also, Nellis' Patent Stacker and Method of conveying Hay, Straw, &c. A ton of Hay can be delivered in three to five minutes to any part of Mow or Stack. The right of Stacker and Conveyer granted free to the Farmer purchasing our Harpoon Hay Fork and Stacks during season of 1875.

Nellis' Grapple. With it Pulley can be attached or detached to raise or lower, without the use of a ladder.

**NELLIS' PULLEY.**  
Improved Wrought Frame, Prepared Wood Wheel. Warranted superior to any Horse Fork Pulley offered in the market.

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Each mouse caught resets the Trap for another.

## TUBULAR

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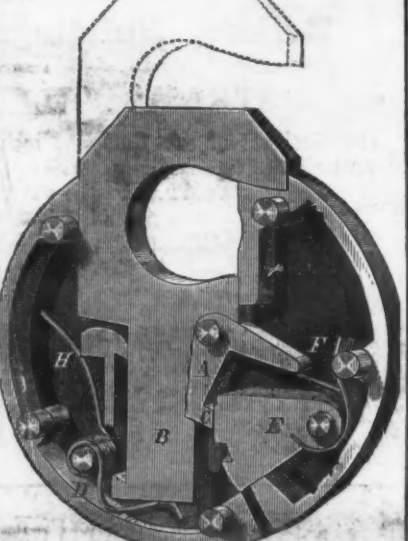
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A Substitute for Steel and Wrought Forgings.  
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Made in the most substantial and compact manner, and are in every respect a superior article. We guarantee that no two locks are alike, unless specially ordered. Each lock furnished with two keys. Any number of locks or keys made to order. Adopted by the United States Government. Samples of No. 1 Lock sent to all parts free, on receipt of \$1.75. Liberal Discounts to the Trade.

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**J. M. EVERHART,**  
Manufacturer of Brass Work for Water, Gas and Steam. Brass Castings and Jobbing promptly attended to.  
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## 445 Miles of Pencils.

The Dixon Crucible Company, of Jersey City, received orders during the first week of this month for 28,000 gross, or, 4,032,000, of Dixon's American Graphite Pencils. It is hardly probable that so great a number of pencils was ever before ordered from any single manufacturer in the world in any one week. Each pencil is seven inches in length, making 2,352,000 feet, or 445 miles, of pencils placed end to end!

To make these will require 83,000 feet of cedar lumber—an entire cargo from Tampa Bay, Florida, where a saw mill is run by the company to saw cedar boards for the Dixon pencils. They are packed in cases containing 50 gross each for shipment, requiring 560 cases and six freight cars to start these pencils from the works of the Dixon Company.

## Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of

## Carriage, Tire, Plow, Stove AND OTHER

## BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.

## Headquarters for Door Springs.

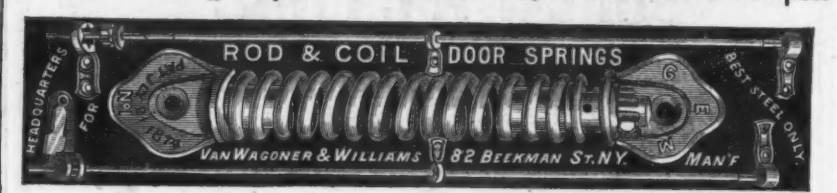
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We GUARANTEE every one of

## The "Gem" Coil Springs

To be of Best Quality of Cast Steel Wire, and Excellent Temper.



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Are warranted to be FIRST-CLASS in every respect.

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The Most Durable for Hot or Cold Water ever made.